TC1200



Reference Manual

Datalogic Automation Srl
Via Lavino, 265
40050 - Monte S. Pietro
Bologna - Italy

TC1200 Reference Manual

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This manual refers to software release 1.1.0 or later.

04/09/12

CONTENTS

REFERENCES

CONVENTIONS

This manual uses the following conventions:

"User" or "Operator" refers to anyone using a TC1200.

"Device" refers to the TC1200.

"You" refers to the System Administrator or Technical Support person using this manual to install, mount, operate, maintain or troubleshoot a TC1200.

REFERENCE DOCUMENTATION

The documentation related to the TC1200 management is listed below:

- GFC-TC1200 Installation Manual
- Datalogic Aladdin™ Help On Line

SERVICES AND SUPPORT

Datalogic provides several services as well as technical support through its website. Log on to **www.automation.datalogic.com** and click on the links indicated for further information:

- **PRODUCTS**

  Search through the links to arrive at your product page which describes specific Info, Features, Applications, Models, Accessories, and Downloads including the Datalogic Aladdin™ utility program, which allows device configuration using a PC. It provides RS232 and USB-COM interface configuration.

- **SERVICE**

  - **Overview** - Warranty Extensions and Maintenance Agreements
  - **Sales Network**- Listing of Subsidiaries, Repair Centers, Partners
  - **Helpdesk**
  - **Material Return Authorization**

PATENTS

This product is covered by one or more of the following patents:

US Patents: 5,311,000; 5,481,098; 5,929,421; 5,992,740; 6,098,883; 6,260,764; 6,443,360 B1; 7,075,663 B2.

European Patents: 789,315 B1; 926,620 B1; 997,760 B1; 1,217,571 B1; 1,804,089 B1.

Chinese Patent: ZL200680050007,8.

Additional patents pending.

SAFETY AND COMPLIANCE NOTICES

FCC COMPLIANCE

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use the equipment.

This device complies with PART 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

POWER SUPPLY

This product is intended to be installed by Qualified Personnel only.

This accessory device is intended to be supplied by a UL Listed or CSA Certified Power Unit with «Class 2» or LPS power source, which supplies power directly to the scanner via the 9-pin or USB connector.

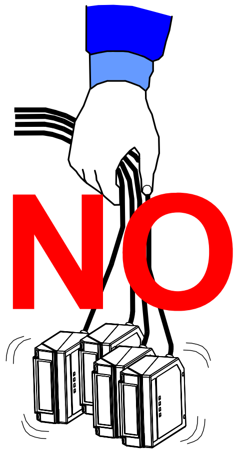
CE COMPLIANCE

Warning:
This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

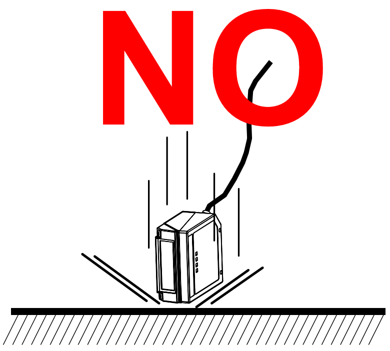
HANDLING

The TC1200 is designed to be used in an industrial environment and is built to withstand vibration and shock when correctly installed, however it is also a precision product and therefore before and during installation it must be handled correctly to avoid damage.

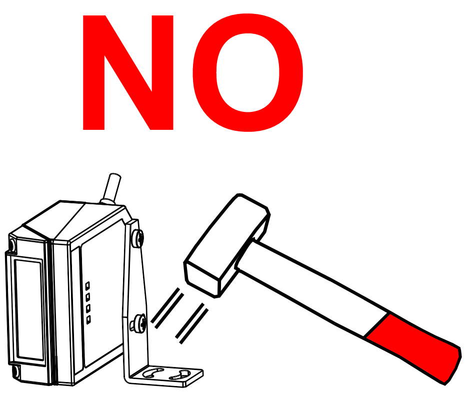
- avoid that the scanners hit one another causing damage. They should be handled separately.



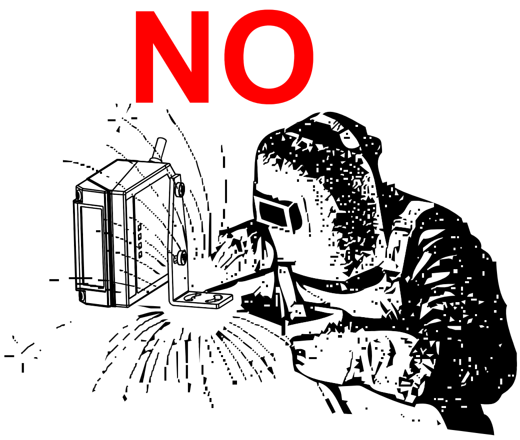
- avoid that the scanners are dropped (exceeding shock limits).



- do not fine tune the positioning by striking the scanner or bracket.



- do not weld the scanner into position which can cause electrostatic, heat or output window damage.



- do not spray paint near the scanner which can cause output window damage.



1 INTRODUCTION

The TC1200 compact CCD reader is the perfect solution for many OEM applications. It contains a built-in decoder and multi-standard interface. Due to its well-balanced mix of technical characteristics it is perfect for integration into custom equipment, setting a new standard in this product class.

This Reference Manual provides connection diagrams, default parameter listing, complete application parameter settings, specific technical features and reading diagrams.

1.1 CONFIGURATION METHODS

1.1.1 Configuration Using Datalogic Aladdin™ (for RS232/USB-COM Interfaces)

The easiest way to configure TC1200 is by using the **Datalogic Aladdin™** utility program downloadable from: www.automation.datalogic.com.

Aladdin allows you to program the TC1200 reader by selecting configuration commands through a user-friendly graphical interface running on a PC. These commands are sent to the reader over the selected communication interface, or they can be printed as barcodes to be scanned.

Aladdin also provides Help On-Line files explaining how to use the program as well as descriptions of the configuration parameters.

Aladdin also provides the ability to perform a software upgrade for the connected device (see the Datalogic Aladdin™ Help On-Line for more details).

1.1.2 Configuration Using Serial Programming Strings (for RS232/USB-COM Interfaces)

This manual contains the complete set of command strings for TC1200 configuration. These strings can be sent via the RS232/USB-COM interface using a terminal emulator such as HyperTerminal.

Refer to Chapter 3 of this manual for configuration procedures using Serial Strings sent by the Host.

1.1.3 Configuration Using Programming Barcode Labels (for all Interfaces)

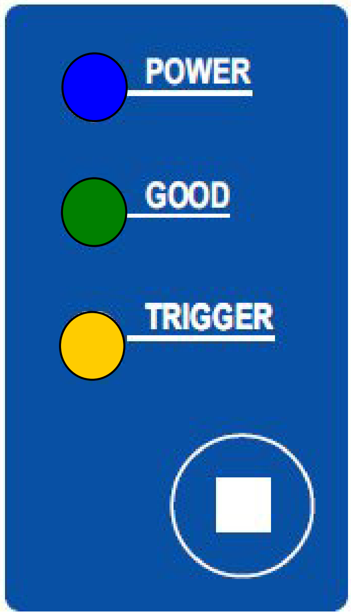
Refer to Chapter 4 of this manual for configuration procedures using Programming Bacode Labels.

1.2 BUTTON AND LED INDICATORS

On the face of the TC1200 scanner a keypad is present with a button and three indicator LEDs which are described in the table below.



TC1200 Scanner



TC1200 Keypad

INDICATORS	Color	MEANING
POWER LED	Blue	ON = Power ON
		OFF = Power OFF or standby (only USB model)
GOOD Read LED	Green	ON = Good Read
		OFF = No Read
		Blinks = USB enumeration
TRIGGER LED	Yellow	ON = External trigger or button pressed
		OFF = No trigger
Button		Press for manual trigger

1.3 AVAILABLE MODELS

The TC1200 reader is available in models that differ in regard to the following characteristics:

- Output Interface
- Enclosure

The following models are therefore available:

- **TC1200-1000** CCD Reader, RS232
- **TC1200-1100** CCD Reader, USB
- **TC1200-0000** Scan Engine CCD Reader, RS232
- **TC1200-0100** Scan Engine CCD Reader, USB

1.4 ACCESSORIES

The following accessories are available to simplify installation and optimize product performance:

Name	**Description**	**Part Number**
CAB-TC1200	CBX Adapter Cable 10-30 Vdc Power Supply	93A051388
CAB-TC1200	to C-BOX 25-p D-sub Fem (TC1100 Compatible)	93A050026
GFC-1200	105° Deflection Mirror for TC1200	93ACC1891

NOTE

The TC1100 Compatible cable does not provide 10-30 Vdc to 5 Vdc conversion. TC1200 must be powered only with 5 Vdc.

2 INSTALLATION

2.1 TC1200 CCD SCANNER

2.1.1 Mechanical Installation

The diagram below gives the overall dimensions of the reader and may be used for its installation.

If you do not use the mounting bracket and screws in the packaging, to avoid damage to the product case and internal components, make sure that mounting screws do not exceed the threaded hole depth of 4 mm.

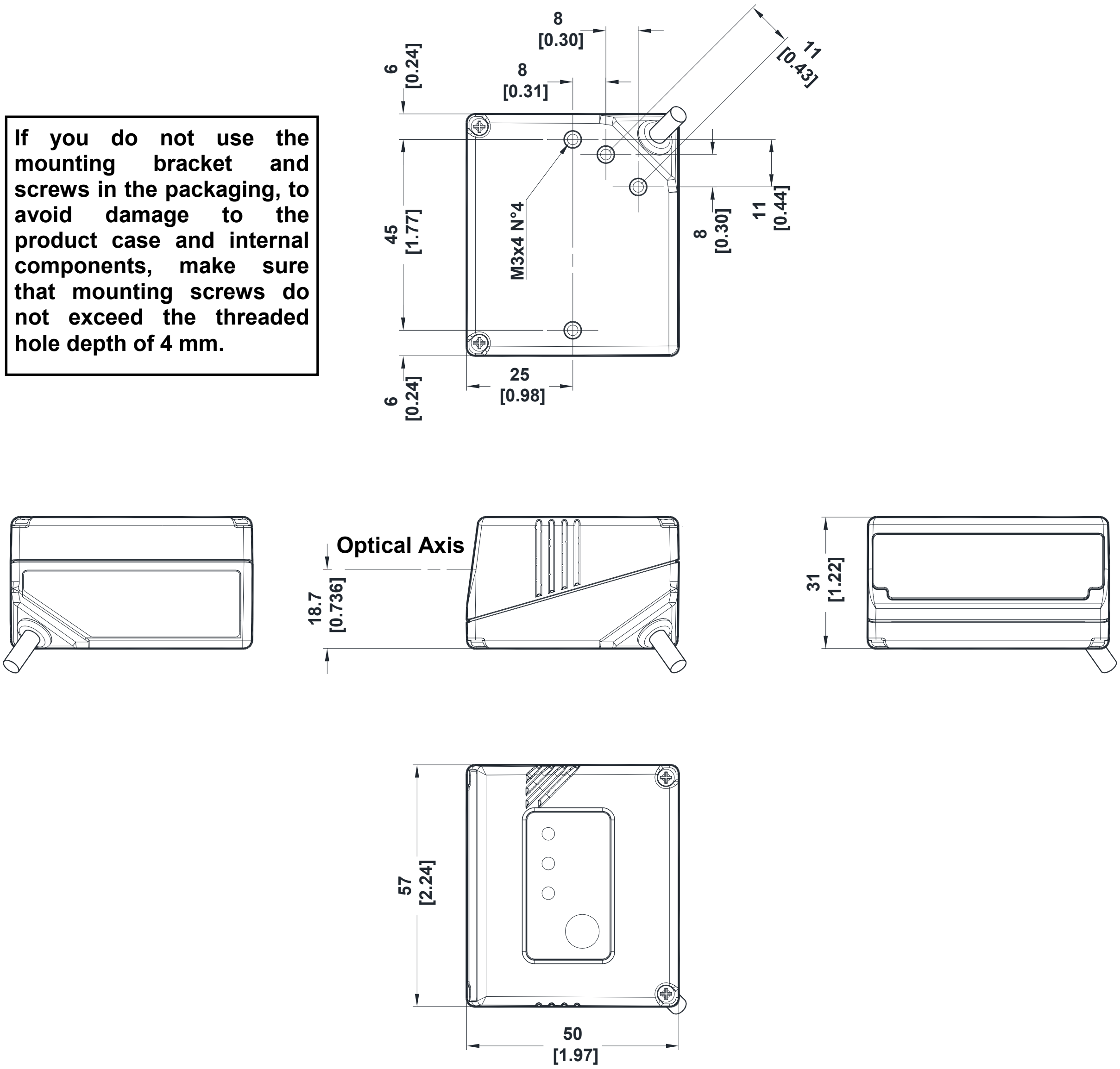


Figure 1 - Overall Dimensions

2.1.2 GFC-1200 105° Deflection Mirror

The GFC-1200 is a 105° deflection mirror that is mounted directly to the TC1200 Scanner.

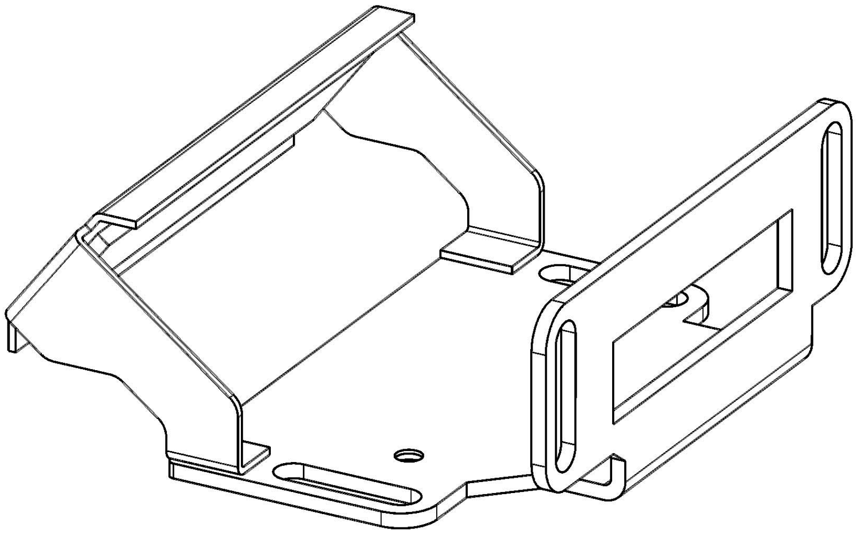


Figure 2 - GFC-1200

The overall dimensions are provided in the figure below and can be used for its mounting.

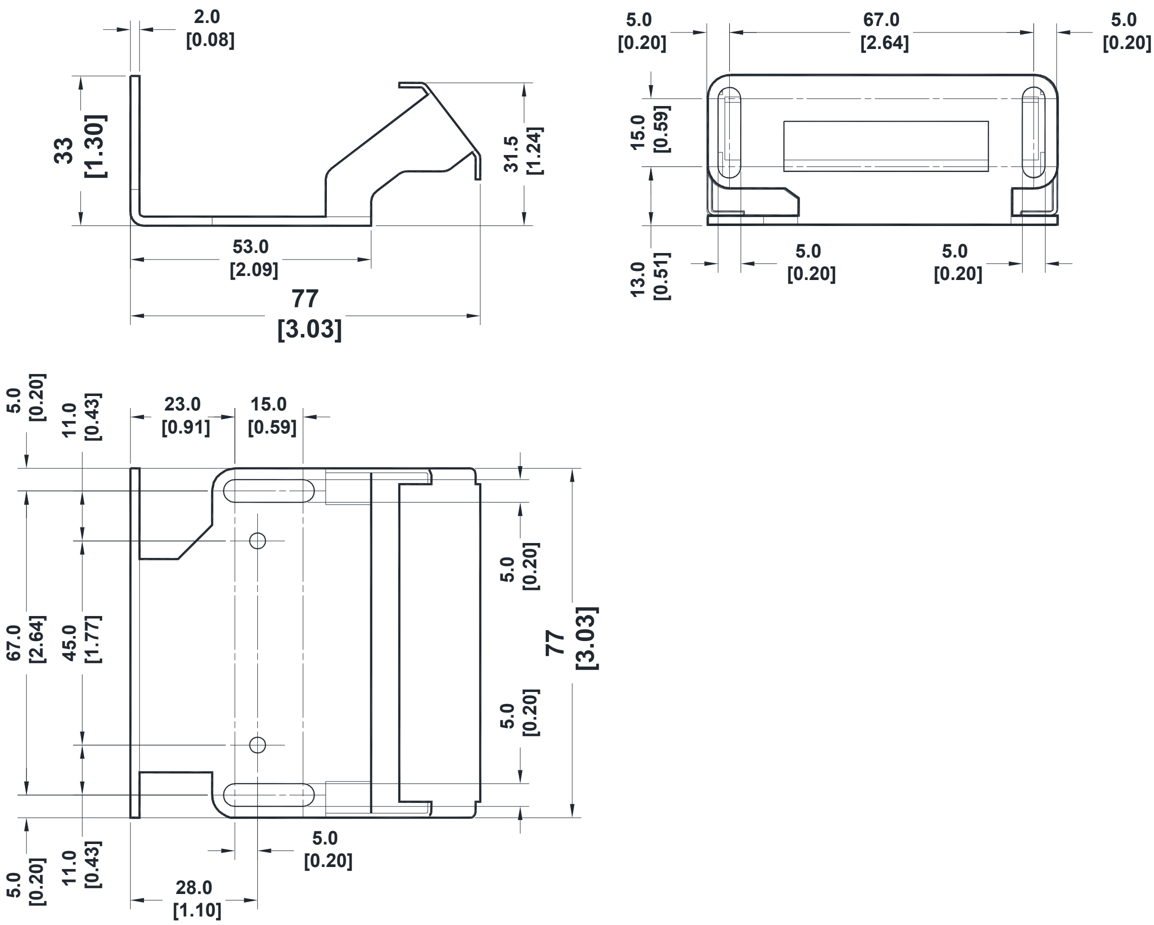


Figure 3 - GFC-1200 Overall Dimensions

To fix a TC1200-1x00 Scanner to the GFC-1200, use two **M3x5** mm screws included in the GFC-1200 package. An extra screw is also supplied as a spare part.

Refer to the figure below.

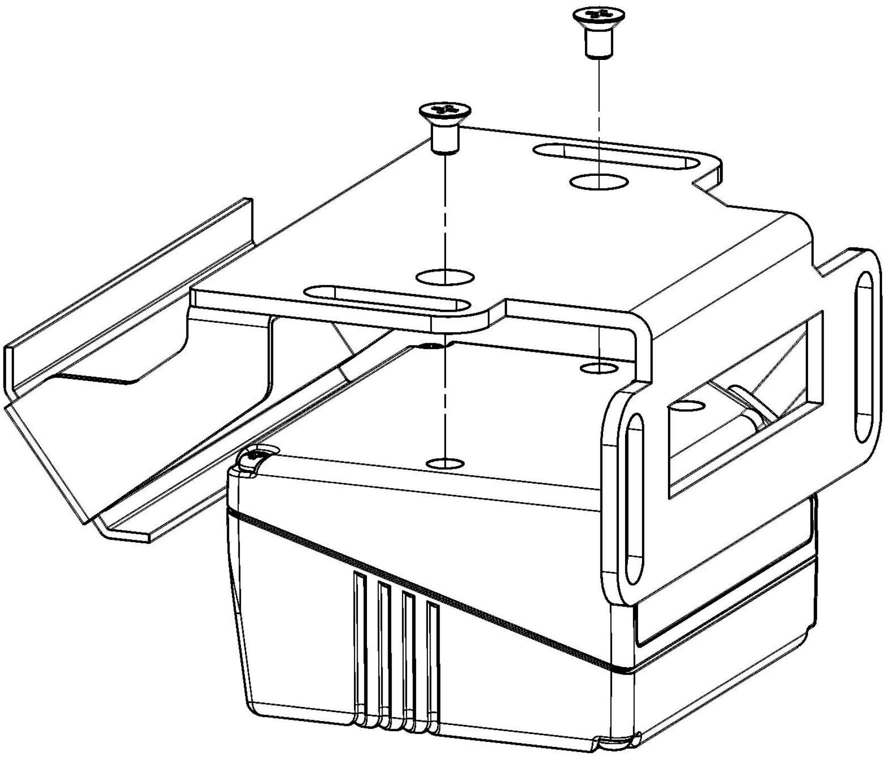


Figure 4 – Fixing TC1200 Scanner to GFC-1200

Based upon the 105° orientation, this mirror embeds the 15° skew angle (± 1.5°), necessary to avoid direct light reflection from the target label. This feature allows mounting the TC1200+GFC-1200 group parallel to the target surface, keeping the overall mounting space to a minimum.

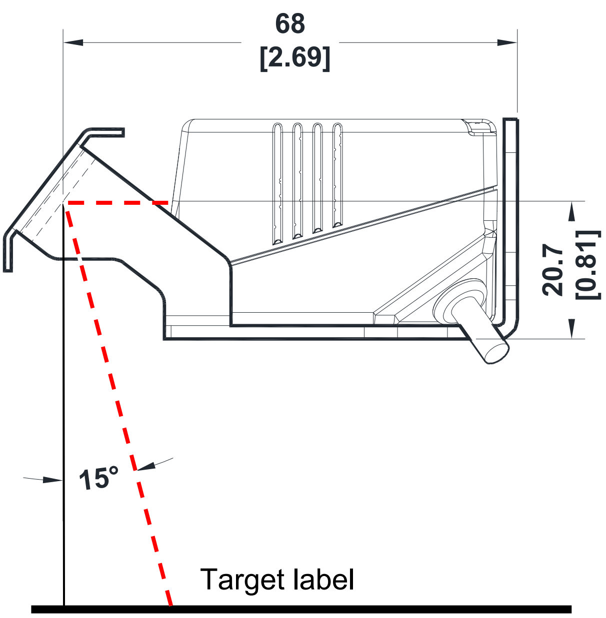


Figure 5 – Maintaining Minimum Skew Angle

2.1.3 CAB-TC1200 Adapter Cable

In order to connect the TC1200 to a CBX100 connection box, you can use the CAB-TC1200 adapter cable. This cable converts the 10-30 Vdc system power to the 5 Vdc necessary for the TC1200 reader. The cable has the following pinout:

25-Pin Connector		
13,9	VDC	Power supply input voltage + (10-30 Vdc)
25,7	GND	Power supply input voltage -
1	SHIELD	Cable Shield
18	EXT TRIG A	External Trigger A (polarity insensitive)
19	EXT TRIG B	External Trigger B (polarity insensitive)
8	OUT1 +	Output 1 positive
11	OUT2 +	Output 2 positive
12,22	OUT1/2 -	Output 1/2 negative
20	RX	Receive data (RS232 Aux on CBX)
21	TX	Transmit data (RS232 Aux on CBX)
2,3,4,5,6,10,23,24	NC	Not connected

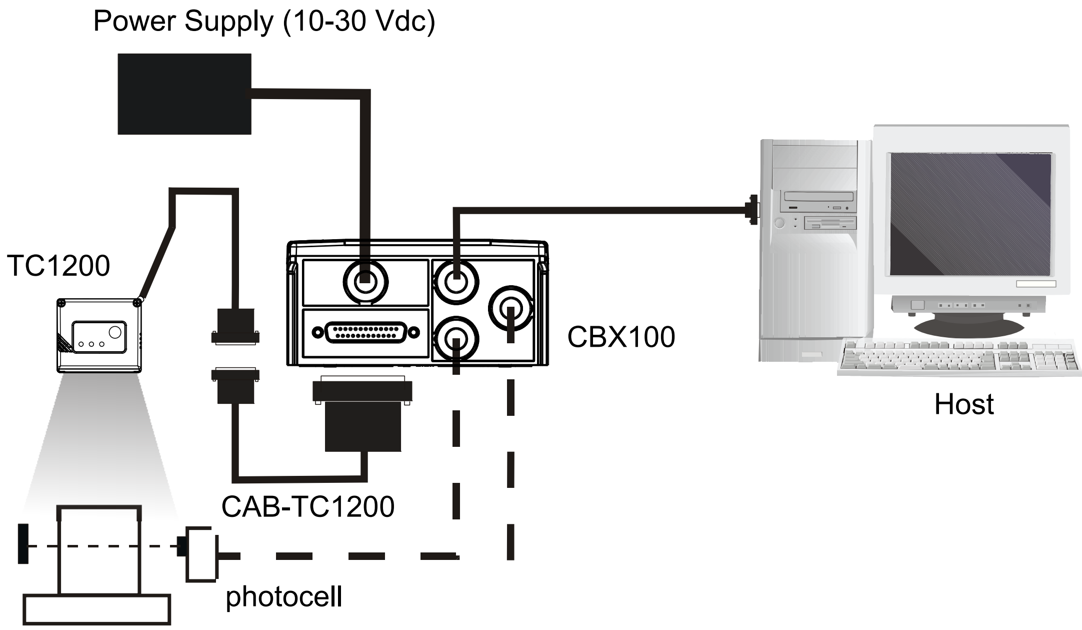


Figure 6 – Typical Layout Using CAB-TC1200

2.1.4 Electrical Connections

The TC1200-1000 Scanner is equipped with a 9-pin Male D-Sub connector for connection to the power supply and input/output signals. The details of the connector pins are indicated in the following table:

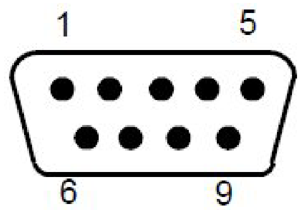


Figure 7 - 9-pin Male D-sub Connector

9-pin Connector		
1	VCC	+5 Vdc
2	GND	Ground
3	RX	Receive Data
4	TX	Transmit Data
5	OUT1 +	Output signal 1, positive
6	OUT1/2 -	Output signal 1/2, negative
7	OUT2 +	Output signal 2, positive
8	EXT TRIG A	External Trigger Input (polarity insensitive)
9	EXT TRIG B	External Trigger Input (polarity insensitive)

Table 1 - TC1200-1000 Scanner Pinout

The TC1200-1100 Scanner is equipped with a USB Type A connector for connection to the PC standard USB Port. The details of the connector pins are indicated in the following table:

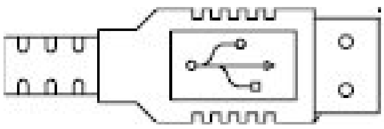


Figure 3 – USB Type A Connector

USB Type A Connector		
1	VCC	+5 Vdc
2	DATA -	USB Data, negative
3	DATA +	USB Data, positive
4	GND	Ground

Table 2 - TC1200-1100 Scanner Pinout

RS232 Interface

The TC1200-1000 Scanner can communicate with the Host using the RS232 signals provided on the 9-pin connector. The pins are indicated in Table 1 and in the following diagram:

It is always advisable to use shielded cables. The overall maximum cable length must be less than 15 m (49.2 ft).

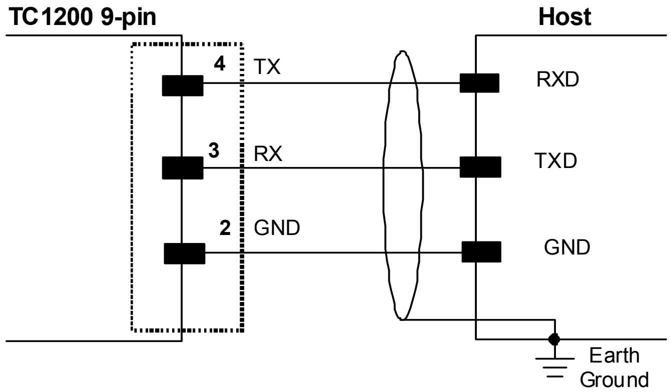


Figure 8 - RS232 Interface Connection to Host

Input

There is an input available on the TC1200-1000 Scanner relative to the External Trigger used to signal the reading phase for On Line Operating Mode. The pins are indicated in Table 1. This input is optocoupled, polarity insensitive and can be driven by both an NPN or PNP type command. The connections are indicated in the following diagrams:

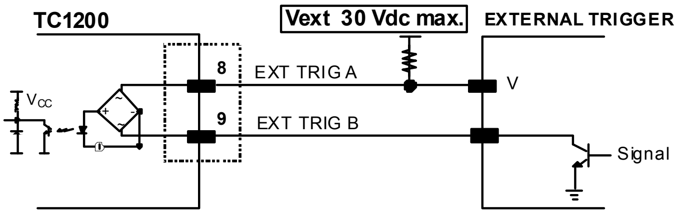


Figure 4 - Input NPN Command Using External Power

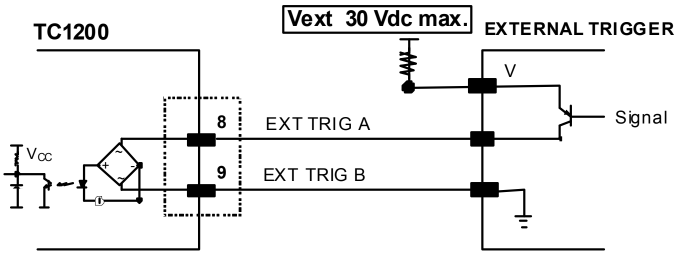


Figure 5 - Input PNP Command Using External Power

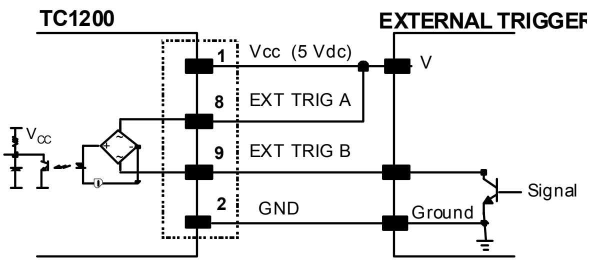


Figure 6 - Input NPN Command Using TC1200 Power

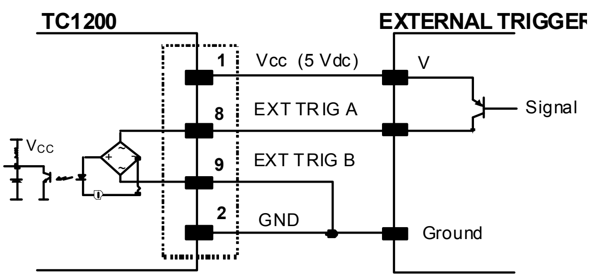


Figure 7 - Input PNP Command Using TC1200 Power

The External Trigger Input can also be activated by the external button (Push Button = Trigger On).

Outputs

There are two outputs available on the TC1200-1000 Scanner. Each output can be activated on one of the following events: Good Read, No Read, Wrong Code.

The active level (high or low) of each Output can also be configured in software.

The pins are indicated in Table 1. The connections are indicated in the following diagram:

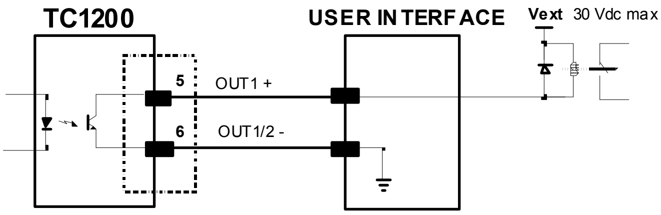


Figure 9 – Output1 Connection. Example NPN

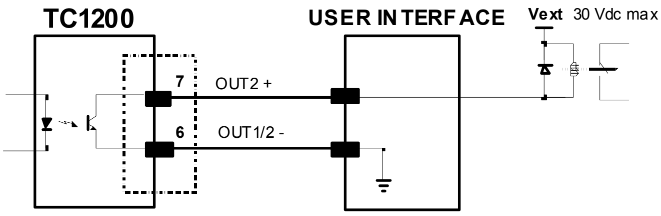


Figure 9 – Output2 Connection. Example NPN

2.2 TC1200 CCD SCAN ENGINE

2.2.1 Mechanical Installation

The diagram below gives the overall dimensions of the TC1200 Scan Engine and may be used for its installation.

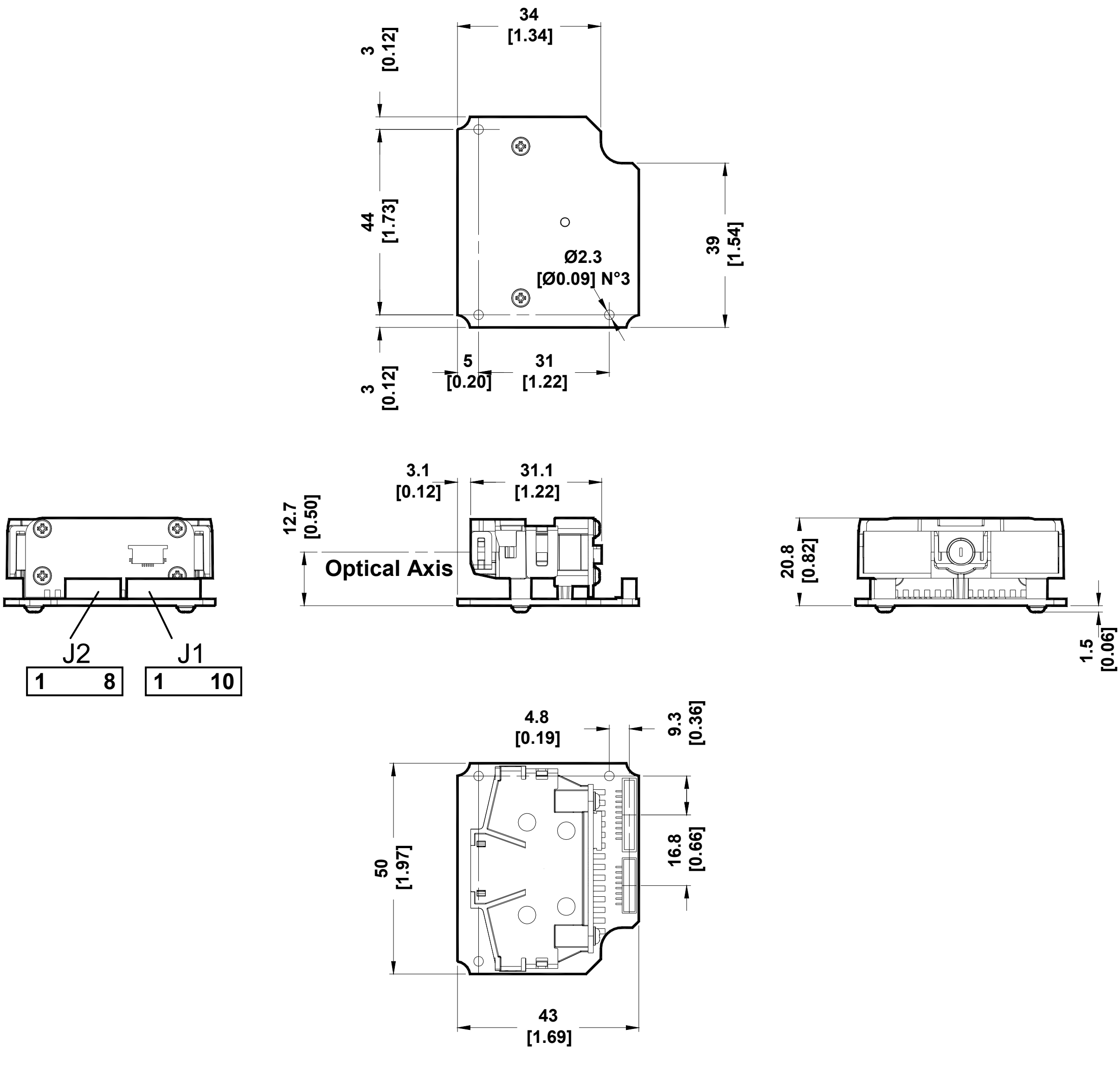


Figure 10 - Overall Dimensions

2.2.2 Electrical Connections

The TC1200-0000 (RS232) Scan Engine is equipped with an 8-pin and a 10-pin DF13 connector for connection to the power supply, data and input/output signals.

The TC1200-0100 (USB) Scan Engine is equipped with a 10-pin DF13 connector for connection to the power supply and data signals. Connector J2 is not mounted and I/O signals are not available.

The details of the connector pins are indicated in the following table:

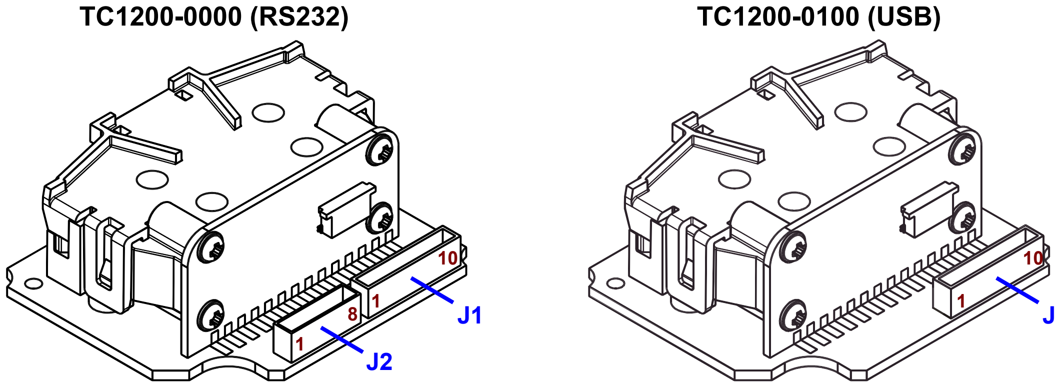


Figure 10 – Scan Engine Connectors

J1		
Pin	**Signal**	**Description**
1	D-	USB Data negative
2	D+	USB Data positive
3	GND	power ground
4	GND	power ground
5	TX	transmit data
6	RTS	NOT USED
7	RX	receive data
8	CTS	NOT USED
9	VCC	+5 Vdc
10	GND	power ground

J2 (RS232 model Only)		
Pin	**Signal**	**Description**
1	GND	power ground
2		NC
3	OUT2 +	Output 2 positive
4	OUT1/2 -	Output 1/2 negative
5	OUT1 +	Output 1 positive
6		NC
7	EXT TRIG A	External Trigger Input (polarity insensitive)
8	EXT TRIG B	External Trigger Input (polarity insensitive)

Table 3 - TC1200 Scan Engine Pinout

RS232 Interface

The TC1200-0000 Scan Engine can communicate with the Host using the RS232 signals provided on the J1 connector. The pins are indicated in Table 1 and in the following diagram:

It is always advisable to use shielded cables. The overall maximum cable length must be less than 15 m (49.2 ft).

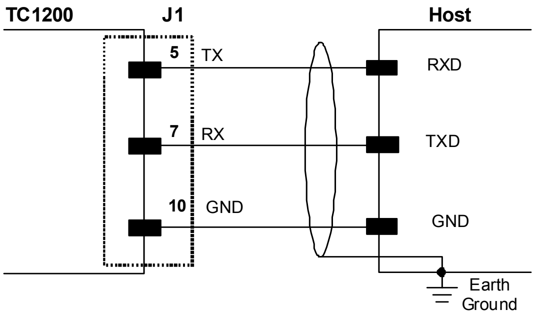


Figure 12 - RS232 Interface Connection to Host

USB Interface

The TC1200-0100 Scan Engine can communicate with the Host using the USB signals provided on the J1 connector. The pins are indicated in Table 1 and in the following diagram:

It is always advisable to use shielded cables. The overall maximum cable length must be less than 15 m (49.2 ft).

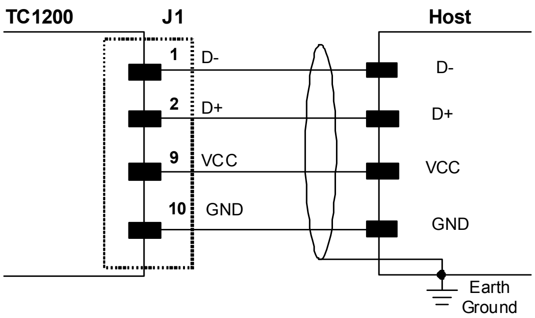


Figure 13 - USB Interface Connection to Host

Input

There is an input available on the TC1200-0000 Scan Engine relative to the External Trigger used to signal the reading phase for On Line Operating Mode. The pins are indicated in Table 1. This input is optocoupled, polarity insensitive and can be driven by both an NPN or PNP type command. The connections are indicated in the following diagrams:

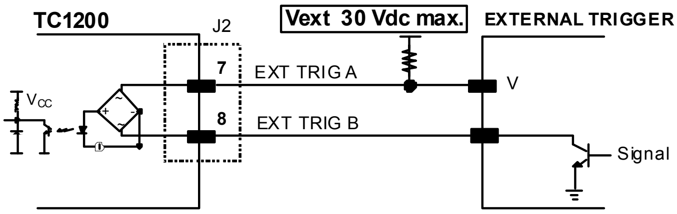


Figure 14 - Input NPN Command Using External Power

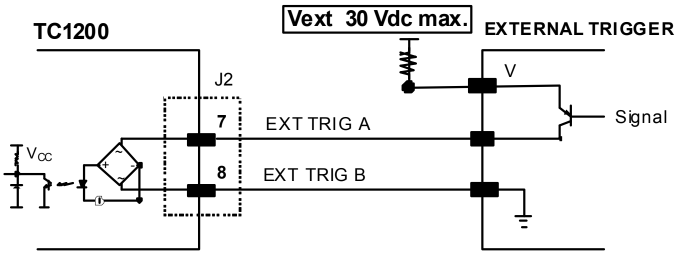


Figure 15 - Input PNP Command Using External Power

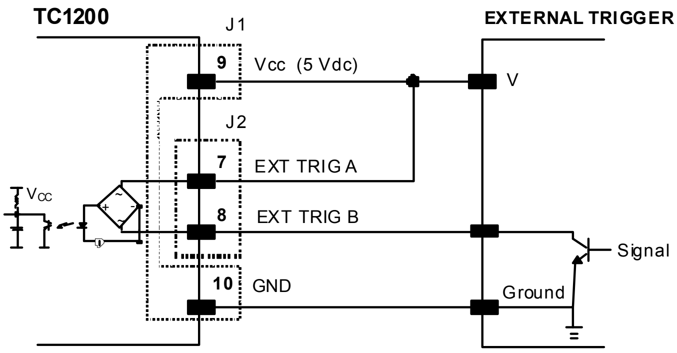


Figure 15 - Input NPN Command Using TC1200 Power

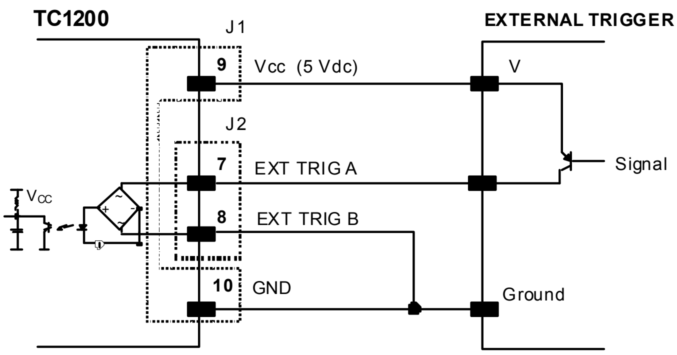


Figure 16 - Input PNP Command Using TC1200 Power

Outputs

There are two outputs available on the TC1200-0000 Scan Engine. Each output can be activated on one of the following events: Good Read, No Read, Wrong Code.

The active level (high or low) of each Output can also be configured in software.

The pins are indicated in Table 1. The connections are indicated in the following diagram:

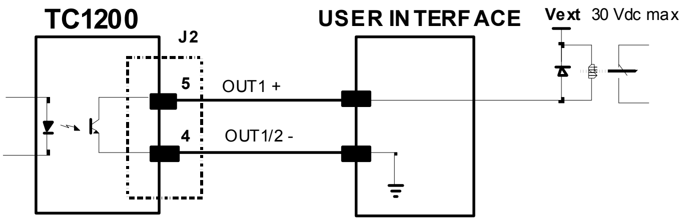


Figure 17 – Output1 Connection. Example NPN

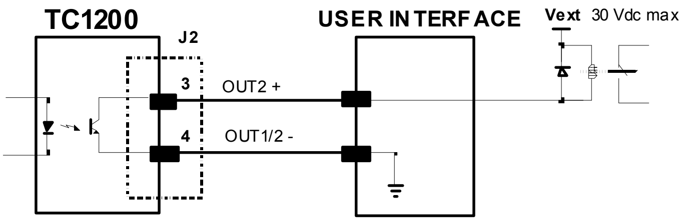
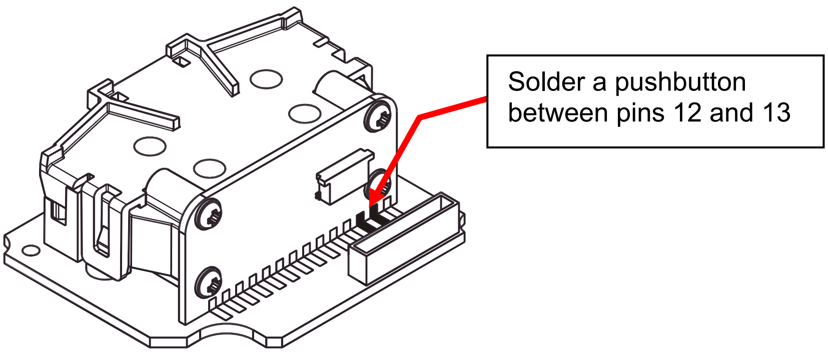


Figure 18 – Output2 Connection. Example NPN

2.2.3 USB-KBD Scan Engine Trigger for Barcode Configuration

If it ever becomes necessary to reconfigure a USB Scan Engine model which has been configured for one of the USB-KBD Interface applications, you can connect a push button trigger by soldering it between pins 12 and 13 of the motherboard connector as shown in the figure below.

TC1200-0100 (USB)



CAUTION	*You must be careful not to short out other pins or components.*

It is recommended to return to the USB-COM interface and choose one of the serial configuration methods. Then you can restore the USB-KBD selection.

2.3 POSITIONING

The TC1200 Scanner is able to decode barcode labels at a variety of angles, however significant angular distortion may degrade reading performance.

When mounting the TC1200 take into consideration these three ideal label position angles: **Pitch 0°, Skew 10° to 30° and Tilt 0°**. Follow the suggestions for the best orientation:

The **Pitch** angle is represented by the value **P** in the figure. Position the reader in order to **minimize** the **Pitch** angle.

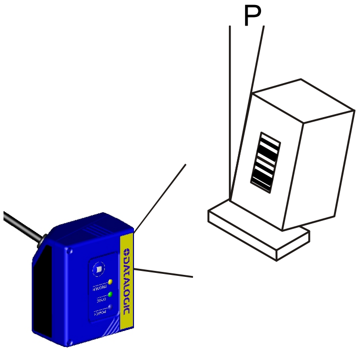


Figure 19 - Pitch Angle

The **Skew** angle is represented by the value **S** in the figure. Position the reader to **assure at least 10°** for the **Skew** angle. This avoids direct light reflection.

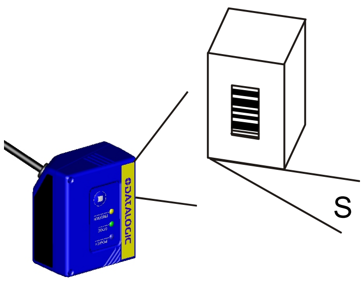


Figure 20 - Skew angle

The **Tilt** angle is represented by the value **T** in the figure. Position the reader in order to **minimize** the **Tilt** angle.

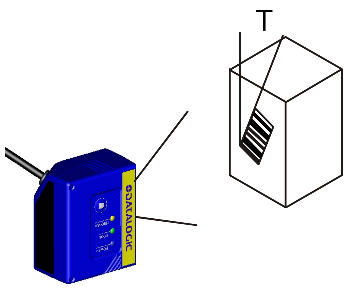


Figure 21 - Tilt angle

2.4 DYNAMIC CODE READING APPLICATIONS

2.4.1 Line Speed vs. Exposure Time

The ***Exposure Time*** defines the time during which the image will be exposed to the reader's sensor for acquisition. In general, a longer time corresponds to a lighter image but is susceptible to blurring due to the code movement; a shorter exposure time corresponds to a darker image.

Assuming:

- **X**: Code Resolution (mm)
- $\mathbf{T_{exp}}$: Exposure Time (s)
- **LS**: Line Speed (mm/s)

for dynamic reading applications, the essential condition to avoid blurring effects between two adjacent elements is:

$$\mathbf{LS * T_{exp} \leq X}$$

For TC1200, the maximum exposure time is 300 μs in a dark environment (no ambient light) using Strobed Exposure Mode. This value, and therefore line speed, is affected by the following environmental conditions:

- **Code Resolution**: a decrease in code resolution, (i.e. **2X)** allows an increase in maximum line speed. There is a decrement of overlapping effects between two adjacent elements.
- **Code/Background Contrast**: a decrease in image contrast (poor quality codes, reflective transparent coverings, different supports and printing techniques) requires a decrease in maximum line speed.
- **Ambient Light**: an increase in external lighting conditions allows an increase in maximum line speed.
- **Reading Distance**: an increase or decrease in reading distance with respect to the center of the focal distance for a given code resolution, (see reading diagram), requires a decrease in maximum line speed.

These environmental conditions are automatically compensated for by one of the selected Reading Condition Recipes (see par 5.2.5. for more details), as well as by the Exposure Mode parameter (see par. 5.2.4 for more details).

The (theoretical) line speed **LS** can be calculated using the following formula:

$$0.8 * X / T_{exp} = LS$$

$LS = 0.8 * (X/T_{exp})$

Where: LS = line speed (in mm/s)
X = code module width (in mm)
T_{exp} = exposure time (in s)

Examples:

For TC1200, **T_{exp}** max is = 300 µs with No Ambient Light (0 Lux) and Strobed Exposure Mode.

Using the maximum exposure time of 300 µs, the following line speeds can be obtained depending on the code resolution:

Code Resolution	Line Speed Calculation
20 mils	[0.8 * 0.508/300 µs] = 1354 mm/s
14 mils	[0.8 * 0.356/300 µs] = 949 mm/s
12 mils	[0.8 * 0.305/300 µs] = 813 mm/s
10 mils	[0.8 * 0.254/300 µs] = 677 mm/s
8 mils	[0.8 * 0.203/300 µs] = 541 mm/s

2.4.2 Step-Ladder Applications

In Step-Ladder reading applications scanning is perpendicular to the code motion direction (Figure 11). For linear barcode reading, this has the advantage of being insensitive to blurring and code resolution since the code elements remain the same between consecutive scans.

The number of scans performed on the code and therefore the decoding capability is influenced by the following parameters:

- number of scans per second (320 scans/sec. max)
- line speed (code motion) see par. 2.4.1
- label dimensions

At least 5 scans during the code passage should be allowed to ensure a successful read.

The number of effective scans performed by the reader in step-ladder is given by the following formula:

SN = [(LH/LS) * SS] – 2 Where:
SN = number of effective scans
LH = label height (in mm)
LS = line speed in (mm/s)
SS = number of scans per second

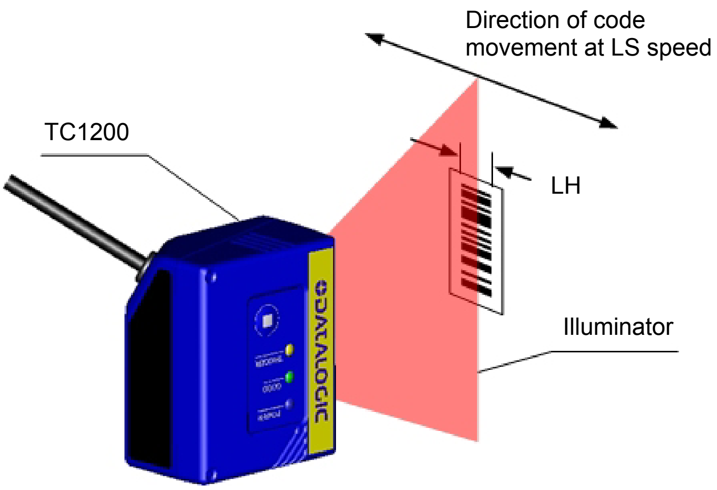


Figure 11 - "Step-Ladder" Reading

Example:

The TC1200 (320 scans/sec.), for a 25 mm high code moving at a line speed of 500 mm/s performs:

[(25/500) * 320] - 2 = 14 effective scans.

2.4.3 Picket-Fence Applications

In Picket-Fence reading applications scanning is parallel to the code motion direction (Figure 12). This makes decoding sensitive to blurring and to code resolution since the code elements change between consecutive scans.

The number of scans performed on the code and therefore the decoding capability is influenced by the following parameters:

- number of scans per second (320 scans/sec. max)
- line speed (code motion) see par. 2.4.1
- label dimensions
- reading field width

NOTE	*The reading field width for dynamic applications is reduced with respect to the static reading field width (reading diagram).*

At least 5 scans during the code passage should be allowed to ensure a successful read.

The number of effective scans performed by the reader in picket-fence is given by the following formula:

SN = [((FW-LW)/LS) * SS] -2   Where:
SN = number of effective scans
FW = reading field width (in mm)
LW = label width (in mm)
LS = label movement speed (in mm/s)
SS = scans per second

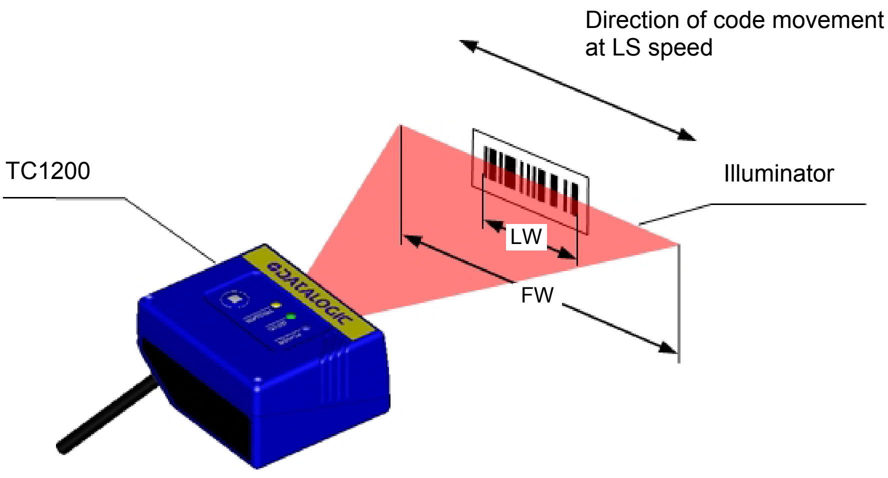


Figure 12 - "Picket-Fence" Reading

Example:

A 60 mm wide code moving in a point where the reading field is 160 mm wide at a 1000 mm/s line speed, the TC1200 (320 scans per sec.), performs:

$$[((160-60)/1000) * 320] - 2 = 30 \text{ effective scans}$$

3 SOFTWARE CONFIGURATION STRINGS

3.1 TC1200 CONFIGURATION

TC1200 RS232 models (as well as USB models having the USB-COM Interface selected), can be configured using the serial strings contained in this chapter:

RS232 Models

To configure TC1200 RS232 models by using the configuration strings:

1) Connect your TC1200 to a PC RS232 port according to the information in chapter 2. Set the PC serial port to the TC1200 default RS232 communication parameters (see Appendix A).

NOTE	*To configure the reader using configuration strings, you must enter Service Mode which automatically sets the reader communication parameters to 115200,N,8,1. You must therefore set the host accordingly for RS232 communications. Upon exiting Service Mode, the programmed communication parameters will be restored.*

2) Using a Terminal Emulation Program, send the Restore Current Interface (Custom) Default string to the reader using the syntax described on the next page.

3) Send all the necessary command strings according to your application's requirements.

USB Models

To configure TC1200 USB models (only for USB-COM Interface) by using the configuration strings:

1) Download and install the USB-COM driver from the TC1200 product page at www.automation.datalogic.com, (bundled with the Aladdin program).

2) Connect your TC1200 to a PC USB port according to the information in chapter 2.

3) Using a Terminal Emulation Program, send the Enter Service Mode command

4) Send the Restore Current Interface (Custom) Default string to the reader using the syntax described on the next page.

5) Send all the necessary command strings according to your application's requirements.

NOTE	*Configuration of TC1200 USB-KBD Interface applications, can be accomplished by reading the barcodes in chapter 4.*

Command Syntax

1. Enter Service (Serial String Programming) Mode

$S<CR>

This command automatically sets the reader communication parameters to 115200,N,8,1.

2. Send Command

$	*Command*	*Parameter*	*Value*	<CR>

Where:

Command:		**Description**
	HA*XX*	Interface Selection
	AA	Enable All Symbologies
	AD	Disable All Symbologies
	R	Reset Reader
	C*XXXXXX*	Write Single Configuration Item to RAM
Parameter:		
	XXXX	A 4-character ASCII string See Serial Configuration Strings Table
Value:		
	XX	A 2-character Hex string See Serial Configuration Strings Table

3. Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode

$Ar<CR>

This command automatically returns the reader to the programmed communication parameters.

Example 1:

1. **$S<CR>**
   Enter Service Mode

2. **$CLFCA02<CR>**
   Write command "Convert to Lower Case" to current configuration

3. **$Ar<CR>**
   Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

Each configuration parameter setting removes the condition previously active for that parameter.

Example 2:

1. **$S<CR>**
   Enter Service Mode

2. **$HA05<CR>**
   Select RS232 Interface

3. **$Ar<CR>**
   Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

Example 3:

1. **$+$!<CR>**
   Read Application Software Release

Example 4:

1. **$S<CR>**
   Enter Service Mode

2. **$CSTON5500000000000000000000000000000000000000<CR>**
   Set Serial START string to the single character "**U**". (20 characters max).

NOTE

For commands requiring string values, you must enter the complete string (maximum number of characters) for that command. This is done by filling the unused characters with zeros (NUL).

SERIAL CONFIGURATION STRINGS

ENTER/EXIT CONFIGURATION COMMANDS	
Description	**Command**
Enter Service Mode (configuration) sets communication parameters to 115200,N,8,1	**S**
Exit Service Mode (configuration) returns to programmed communication parameters	**s**
Apply Configuration to RAM (temporary memory) and Exit Service Mode	**r01**
Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode	**Ar**

NOTE

To configure the reader using configuration strings, you must enter Service Mode which automatically sets the reader communication parameters to 115200,N,8,1. You must therefore set the host accordingly for RS232 communications. Upon exiting Service Mode, the programmed communication parameters will be restored.

CONFIGURATION COMMANDS	
Description	**Command**
Write Single Configuration Item to RAM (temporary memory)	**Cxxxxxx**
Read Single Configuration Item from RAM (temporary memory)	**cxxxx**
Reset Reader	**R**
Read Application Software Release (does not require Enter/Exit Service Mode)	**$+$!**
Host Commands Obey	**CIFIH00**
Host Commands Ignore	**CIFIH01**
Enable all Symbologies	**AA**
Disable all Symbologies	**AD**

NOTE

To read a particular parameter setting from the reader, send the read parameter command without any value. The reader will respond with its currently configured value.

NOTE

The Read Application Software Release command is a direct command that does not require entering Service Mode.

INTERFACE SELECTION COMMANDS	
Description	**Command**
Restore Current Interface (Custom) Default Configuration	**HA00**
RS232	**HA05**
USB-COM	**HA47**
USB-KBD	**HA35**
USB-KBD-ALT	**HA2B**
USB KBD-APPLE	**HA2C**

NOTE

The Interface Selection commands store and load the new interface type with its factory defaults into the current configuration.

RS232 ONLY PARAMETERS			
Description		**Parameter**	**Value**
Baud Rate	1200	**R2BA**	**00**
	2400		**01**
	4800		**02**
	9600		**03**
	19200		**04**
	38400		**05**
	57600		**06**
	115200		**07**
Parity	none	**R2PA**	**00**
	even		**01**
	odd		**02**
Data Bits	7	**R2DA**	**00**
	8		**01**
Stop Bits	1	**R2ST**	**00**
	2		**01**

RS232/USB-COM PARAMETERS			
Description		**Parameter**	**Value**
Intercharacter Delay	No delay or from 10 to 990 ms	**R2IC**	***a***
Disable Character	host command character which disables the reader	**R2DC**	***b***
Enable Character	host command character which enables the reader	**R2EC**	***b***
ACK/NAK Options	disable	**R2AE**	**00**
	enable for label transmission		**01**
	enable for host command acknowledge		**02**
	enable for label transmission and host command acknowledge		**03**
ACK Character	Selects character to be used as ACK	**R2AC**	***c***
NAK Character	Selects character to be used as NAK	**R2NA**	***c***
ACK/NAK Timeout Value	No timeout or from 200 to 15000 ms	**R2AT**	***d***
ACK/NAK Retry Count	From 0 to unlimited retries	**R2AR**	***e***
ACK/NAK Error Handling	Ignore errors detected	**R2EH**	**00**
	Process errors as valid ACK character		**01**
	Process errors as valid NAK character		**02**

a = Hex value from **00** to **63** representing the decimal number *(00 = no delay; all others x10 ms)*

b = Hex value from **00** to **FE** representing the ASCII character

c = Hex value from **00** to **FF** representing the ASCII character

d = Hex value from **00** to **4B** representing the decimal number *(00 = timeout disabled; all others x200 ms)*

e = Hex value from **00** to **FF** representing the number of retries *(00 = no retries; 01-FE = 1-254 retries; FF = unlimited retries)*

USB-KBD / USB-KBD-ALT / USB-KBD-APPLE PARAMETERS			
Description		**Parameter**	**Value**
Keyboard Country Mode	*US	**KBCO**	**00**
	*Belgium		**01**
	*Britain		**02**
	Croatia		**11**
	Czechoslovakia		**0E**
	Denmark		**03**
	*France		**04**
	*Germany		**05**
	Hungary		**0D**
	*Italy		**06**
	Japanese (106 key)		**0C**
	Norway		**07**
	Poland		**12**
	Portugal		**08**
	Romania		**10**
	Slovakia		**0F**
	*Spain		**09**
	*Sweden		**0A**
	Switzerland		**0B**
Keyboard Intercode Delay	No delay or from 1 to 99 seconds	**KBID**	***f***
Send Control Characters	CTRL + KEY	**KBSC**	**00**
	CTRL + SHIFT + KEY		**01**
	Special Function KEY		**02**
USB Keyboard Speed	1 ms	**KBSP**	**01**
	2 ms		**02**
	3 ms		**03**
	4 ms		**04**
	5 ms		**05**
	6 ms		**06**
	7 ms		**07**
	8 ms		**08**
	9 ms		**09**
	10 ms		**0A**

f = Hex value from **00** to **63** representing the decimal number *(00 = no delay; all others x1 s)*

***** = Valid for USB-KBD-APPLE

READING PARAMETERS PARAMETERS			
Description		**Parameter**	**Value**
Illumination Mode	Disabled	**SPIL**	**00**
	Triggered		**01**
	Enabled		**02**
Operating Modes	On Line	**SNRM**	**00**
	Serial On Line		**01**
	Automatic		**02**
	Automatic (Object Sense)		**03**
	Test		**04**
Automatic Threshold	From 2 to 255 scans without a code	**SNAT**	***g***
Phase Off Event	Trigger Stop	**SNTO**	**00**
	Timeout		**01**
	Trigger Stop-Timeout		**02**
Timeout	From 40 to 5100 ms	**SNET**	***h***
Serial Start	Any string of characters *(max 20)* between 00-FE	**STON**	***i***
Serial Stop	Any string of characters *(max 20)* between 00-FE	**STOF**	***i***
LED Indication	On Decode	**BPIN**	**00**
	After Transmission		**01**
Label Programming Mode	Disabled	**FAPM**	**00**
	Enabled		**01**
Exposure Mode	Continuous	**SPST**	**00**
	Strobed		**01**
Reading Conditions	Auto	**SNCO**	**00**
	Standard		**01**
	High Resolution (Far)		**02**
	Difficult		**03**
	Blurred (Near)		**04**

g = Hex value from **02** to **FF** representing the number of scans without a code

h = Hex value from **02** to **FF** representing the decimal number *(x20 ms)*

i = Hex value from **00** to **FE** representing the ASCII character

DATA FORMAT			
Description		**Parameter**	**Value**
Data Transmission	On Decode	**LFTX**	**01**
	After Phase Off		**00**
Code Verifier Mode	Disabled	**LFCV**	**00**
	Transmit Wrong String		**01**
	Transmit Wrong Code		**02**
Match String	Any string of characters *(max 20)* between 00-FE	**COVS**	***k***
Wrong Code String	Any string of characters *(max 20)* between 00-FE	**WCVS**	***k***
Case Conversion	Disable	**LFCA**	**00**
	Upper Case		**01**
	Lower Case		**02**
Global Prefix (Header)	Any string of characters *(max 20)* between 00-FE	**LFPR**	***k***
Global Suffix (Terminator)	Any string of characters *(max 20)* between 00-FE	**LFSU**	***k***
No Read String	Any string of characters *(max 20)* between 00-FE	**NORS**	***k***
Character Conversion	An 8-character string between 00-FF	**LFCH**	***m***
Transmit AIM IDs	Disable	**AIEN**	**00**
	Enable		**01**
Transmit Custom Label IDs	Disable	**IDCO**	**00**
	Prefix		**01**
	Suffix		**02**
GS1-128 AIM ID	Disable	**U8AI**	**00**
	Enable		**01**

k = Hex value from **00** to **FE** representing the ASCII character

m =8 Hex values from **00** to **FF** representing the 8 ASCII characters *(FF = no replacement or ignore)*

DATA FORMAT			
Description		**Parameter**	**Value**
Custom Code Identifiers	Any string of characters *(max 3)* between 00-FE		
UPC-A		**ABID**	***k***
UPC-E		**EBID**	***k***
EAN-8		**8BID**	***k***
EAN-13		**3BID**	***k***
UPC-A/P2		**A2ID**	***k***
UPC-A/P5		**A5ID**	***k***
UPC-E/P2		**E2ID**	***k***
UPC-E/P5		**E5ID**	***k***
EAN-8/P2		**82ID**	***k***
EAN-8/P5		**85ID**	***k***
EAN-13/P2		**32ID**	***k***
EAN-13/P5		**35ID**	***k***
ISBN		**ISID**	***k***
ISSN		**INID**	***k***
GTIN for EAN/UPC w/o Add-On		**GBID**	***k***
GTIN for EAN/UPC w P2		**G2ID**	***k***
GTIN for EAN/UPC w P5		**G5ID**	***k***
Code 39		**C3ID**	***k***
Code 32		**P3ID**	***k***
Code 128		**C8ID**	***k***
GS1-128		**U8ID**	***k***
ISBT 128		**I8ID**	***k***
Interleaved 2 of 5		**I2ID**	***k***
Standard 2 of 5		**S2ID**	***k***
Codabar		**CBID**	***k***
ABC Codabar		**ACID**	***k***
Code 11		**C1ID**	***k***
GS1 Databar 14 (Omnidirectional)		**4BID**	***k***
GS1 Databar Expanded		**XBID**	***k***
GS1 Databar Limited		**LBID**	***k***
Code 93		**C9ID**	***k***
MSI		**MSID**	***k***

k = Hex value from **00** to **FE** representing the ASCII character

DIGITAL OUTPUTS			
Description		**Parameter**	**Value**
OUTPUT 1			
Activation Event	Disable	**OUA1**	**00**
	Good Read		**01**
	No Read		**02**
	Wrong Code		**03**
Deactivation Event	Disable	**OUD1**	**00**
	Timeout		**01**
	Reading Phase Active		**02**
Deactivation Timeout	100 to 25500 ms	**OUT1**	***n***
Active Level	Closed	**OUL1**	**00**
	Open		**01**
OUTPUT 2			
Activation Event	Disable	**OUA2**	**00**
	Good Read		**01**
	No Read		**02**
	Wrong Code		**03**
Deactivation Event	Disable	**OUD2**	**00**
	Timeout		**01**
	Reading Phase Active		**02**
Deactivation Timeout	100 to 25500 ms	**OUT2**	***n***
Active Level	Closed	**OUL2**	**00**
	Open		**01**

n = Hex value from **01** to **FF** representing the decimal number *(x100 ms)*

POWER SAVE			
Description		**Parameter**	**Value**
Sleep Mode Timeout	Disable	SLTO	00
	10 seconds		01
	30 seconds		02
	1 minute		03
	5 minutes		04
	10 minutes		05

CODE SELECTION			
Description		**Parameter**	**Value**
Positive/Negative Background	Positive	CGRD	00
	Negative		01
	Both		02
UPC-A			
UPC-A	Disable	ABEN	00
	Enable		01
Check Character Tx	Disable	ABCT	00
	Enable		01
Expand to EAN-13	Disable	AB3B	00
	Enable		01
Number System Tx	Disable	ABNS	00
	Enable		01
Minimum Reads	One Read	ABMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Coupon Control	Allow all coupon barcodes to be decoded	CPCL	00
	Enable only UPC-A coupon decoding		01
	Enable only GS1 Databar coupon decoding		02
UPC-E			
UPC-E	Disable	EBEN	00
	Enable		01
Check Character Tx	Disable	EBCT	00
	Enable		01
Expand to UPC-A	Disable	EBAB	00
	Enable		01
Expand to EAN-13	Disable	EB3B	00
	Enable		01
Number System Tx	Disable	EBNS	00
	Enable		01
Minimum Reads	One Read	EBMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
EAN-13			
EAN-13	Disable	3BEN	00
	Enable		01
Check Character Tx	Disable	3BCT	00
	Enable		01
ISBN Conversion	Disable	3BIS	00
	Enable		01
ISSN Conversion	Disable	3BIN	00
	Enable		01
Flag 1 Character	Disable	3BF1	00
	Enable		01
Minimum Reads	One Read	3BMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Coupon Control	Allow all coupon barcodes to be decoded	CPCL	00
	Enable only UPC-A coupon decoding		01
	Enable only GS1 Databar coupon decoding		02

CODE SELECTION			
Description		**Parameter**	**Value**
EAN-8			
EAN-8	Disable	**8BEN**	**00**
	Enable		**01**
Check Character Tx	Disable	**8BCT**	**00**
	Enable		**01**
Expand to EAN-13	Disable	**8B3B**	**00**
	Enable		**01**
Minimum Reads	One Read	**8BMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Add-Ons			
P2 Add-On	Disable	**ADO2**	**00**
	Enable		**01**
P5 Add-On	Disable	**ADO5**	**00**
	Enable		**01**
P2 Minimum Reads	One Read	**ADM2**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
P5 Minimum Reads	One Read	**ADM5**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Optional Add-On Timer	Timer disabled or from 10 to 300 ms	**ADOT**	***p***
EAN/UPC Global Settings			
GTIN Format	Disable	**GBEN**	**00**
	Enable		**01**
Decoding Level	Disable	**UNDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**UNCO**	**00**
	Enable		**01**
In-Store Minimum Reads	One Read	**INMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**

p = Hex value from **00** to **1E** representing the decimal number *(00 = Timer disabled; all others x10 ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
Code 39			
Code 39	Disable	C3EN	00
	Enable		01
Code 39 Full ASCII	Disable	C3FA	00
	Enable		01
Code Length Control	Variable	C3LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	C3L1	*q*
	Length 2 (or Max Length) 0 or from 1 to 50 characters	C3L2	*q*
Code 32 (Italian Pharma)	Disable	P3EN	00
	Enable		01
Code 32 Check Tx	Disable	P3CT	00
	Enable		01
Code 32 Start/Stop Tx	Disable	P3SS	00
	Enable		01
Check Options			
Check Calculation	Disable	C3CC	00
	Enable Standard Check		01
	Enable Mod-7 Check		02
	Enable Italian Post Check		04
	Enable Daimler Chrysler Check		08
Code 39 Check Tx	Disable	C3CT	00
	Enable		01
Code 39 Start/Stop Tx	Disable	C3SS	00
	Enable		01
Decoding Options			
Minimum Reads	One Read	C3MR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	C3DL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Interdigit Ratio	Any ratio or 1 to 10	C3IR	*r*
Character Correlation	Disable	C3CO	00
	Enable		01
Quiet Zones	Quiet Zone on One Side	C3LO	01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
	Small Quiet Zones on Two Sides		05
Stitching	Disable	C3ST	00
	Enable		01

q = Hex value from **00** to **32** representing the decimal number

r = Hex value from **00** to **0A** representing the decimal number of the interdigit space/module ratio (00 = any ratio)

CODE SELECTION			
Description		**Parameter**	**Value**
Code 128 (GS1-128)			
Code 128	Disable	C8EN	00
	Enable		01
GS1-128 Enable	Enable (transmit labels in Code 128 data format)	U8EN	00
	Enable (transmit labels in GS1-128 data format)		01
	Disable		02
Code Length Control	Variable	C8LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 80 characters	C8L1	*s*
	Length 2 (or Max Length) 0 or from 1 to 80 characters	C8L2	*s*
Expand to Code 39	Disable	C8C3	00
	Enable		01
Check Options			
Check Tx	Disable	C8CT	00
	Enable		01
Function Character Tx	Disable	C8TF	00
	Enable		01
Sub-Code Change Tx	Disable	C8SC	00
	Enable		01
Decoding Options			
Minimum Reads	One Read	C8MR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	C8DL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Character Correlation	Disable	C8CO	00
	Enable		01
Quiet Zones	No Quiet Zones	C8LO	00
	Quiet Zone on One Side		01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
Stitching	Disable	C8ST	00
	Enable		01
ISBT 128			
ISBT 128 Concatenation	Disable	I8CE	00
	Enable		01
Concatenation Mode	Static	I8CM	00
	Dynamic		01
Dynamic Concat. Timeout	From 50 to 2550 ms	I8DT	*t*
Chain 0 - Chain 15	Contact Datalogic		

s = Hex value from **00** to **50** representing the decimal number

t = Hex value from **05** to **FF** representing the decimal number *(x10 ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
Interleaved 2 of 5 (I 2 of 5)			
I 2 of 5	Disable	I2EN	00
	Enable		01
Code Length Control	Variable	I2LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 2 to 50 characters (only even numbers)	I2L1	*v*
	Length 2 (or Max Length) from 0 or from 2 to 50 characters (only even numbers)	I2L2	*v*
Check Options			
Check Calculation	Disable	I2CC	00
	Enable Standard(Mod 10)		01
	Enable German Parcel		02
	Enable DHL		04
	Enable Daimler Chrysler		08
	Enable Bosch		10
	Enable Italian Post		20
Check Tx	Disable	I2CT	00
	Enable		01
Decoding Options			
Minimum Reads	One Read	I2MR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	I2DL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Character Correlation	Disable	I2CO	00
	Enable		01
Stitching	Disable	I2ST	00
	Enable		01
Zero Pattern	Disable	I2ZP	00
	Enable		01
Standard 2 of 5			
Standard 2 of 5	Disable	S2EN	00
	Enable		01
Code Length Control	Variable	S2LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	S2L1	*v*
	Length 2 (or Max Length) 0 or from 1 to 50 characters	S2L2	*v*
Check Options			
Check Calculation	Disable	S2CC	00
	Enable		01
Check Tx	Disable	S2CT	00
	Enable		01
Decoding Options			
Minimum Reads	One Read	S2MR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	S2DL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Character Correlation	Disable	S2CO	00
	Enable		01
Stitching	Disable	S2ST	00
	Enable		01

v = Hex value from **00** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Industrial 2 of 5			
Industrial 2 of 5	Disable	**U2EN**	**00**
	Enable		**01**
Code Length Control	Variable	**U2LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**U2L1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**U2L2**	***v***
Check Options			
Check Calculation	Disable	**U2CC**	**00**
	Enable		**01**
Check Tx	Disable	**U2CT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**U2MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Character Correlation	Disable	**U2CO**	**00**
	Enable		**01**
Stitching	Disable	**U2ST**	**00**
	Enable		**01**

v = Hex value from **00** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Codabar			
Codabar	Disable	**CBEN**	**00**
	Enable		**01**
Code Length Control	Variable	**CBLC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 3 to 50 characters	**CBL1**	***v***
	Length 2 (or Max Length) 0 or from 3 to 50 characters	**CBL2**	***v***
ABC Codabar			
ABC Codabar	Disable	**CBAB**	**00**
	Enable		**01**
Concatenation Mode	Static	**CBCM**	**00**
	Dynamic		**01**
Dynamic Concat. Timeout	From 50 to 2550 ms	**CBDT**	***t***
Check Options			
Check Calculation	Disable	**CBCC**	**00**
	Enable AIM Standard Check		**01**
	Enable Mod-10 Check		**02**
Check Tx	Disable	**CBCT**	**00**
	Enable		**01**
Start/Stop Set	ABCD/TN*E	**CBSC**	**00**
	ABCD/ABCD		**01**
	abcd/tn*e		**02**
	abcd/abcd		**03**
Start/Stop Tx	Disable	**CBSS**	**00**
	Enable		**01**
Start/Stop Match	Disable	**CBSM**	**00**
	Enable		**01**

v = Hex value from **00** or **03** to **32** representing the decimal number

t = Hex value from **05** to **FF** representing the decimal number *(x10 ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
Decoding Options			
Minimum Reads	One Read	CBMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	CBDL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Character Correlation	Disable	CBCO	00
	Enable		01
Interdigit Ratio	Any ratio or 1 to 10	CBIR	*r*
Quiet Zones	Quiet Zone on One Side	CBLO	01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
	Small Quiet Zones on Two Sides		05
Stitching	Disable	CBST	00
	Enable		01

r = Hex value from **00** to **0A** representing the decimal number of the interdigit space/module ratio (00 = any ratio)

CODE SELECTION			
Description		**Parameter**	**Value**
Code 11			
Code 11	Disable	C1EN	00
	Enable		01
Code Length Control	Variable	C1LC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 2 to 50 characters	C1L1	*v*
	Length 2 (or Max Length) 0 or from 2 to 50 characters	C1L2	*v*
Check Options			
Check Calculation	Disable	C1CC	00
	Enable Check C		01
	Enable Check K		02
	Enable Check C and K		03
Check Tx	Disable	C1CT	00
	Enable		01
Decoding Options			
Minimum Reads	One Read	C1MR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	C1DL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Character Correlation	Disable	C1CO	00
	Enable		01
Interdigit Ratio	1 to 10	C1IR	*r*
Stitching	Disable	C1ST	00
	Enable		01

v = Hex value from **00** to **32** representing the decimal number

r = Hex value from **00** to **0A** representing the decimal number of the interdigit space/module ratio (00 = any ratio)

CODE SELECTION			
Description		**Parameter**	**Value**
GS1 Databar Omnidirectional			
GS1 Databar Omnidirectional	Disable	**4BEN**	**00**
	Enable		**01**
GS1-128 Emulation	Disable	**4BU8**	**00**
	Enable		**01**
Omnidirectional Decoding Options			
Minimum Reads	One Read	**4BMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
GS1 Databar Expanded			
GS1 Databar Expanded	Disable	**XBEN**	**00**
	Enable		**01**
GS1-128 Emulation	Disable	**XBU8**	**00**
	Enable		**01**
Code Length Control	Variable	**XBLC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 74 characters	**XBL1**	***w***
	Length 2 (or Max Length) 0 or from 1 to 74 characters	**XBL2**	***w***
Expanded Decoding Options			
Minimum Reads	One Read	**XBMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Coupon Control	Allow all coupon barcodes to be decoded	**CPCL**	**00**
	Enable only UPC-A coupon decoding		**01**
	Enable only GS1 Databar coupon decoding		**02**
GS1 Databar Limited			
GS1 Databar Limited	Disable	**LBEN**	**00**
	Enable		**01**
GS1-128 Emulation	Disable	**LBU8**	**00**
	Enable		**01**
GS1 Databar Limited (continued)			
Limited Decoding Options			
Minimum Reads	One Read	**LBMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Code 93			
Code 93	Disable	**C9EN**	**00**
	Enable		**01**
Code Length Control	Variable	**C9LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**C9L1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**C9L2**	***v***
Check Options			
Check Calculation	Disable	**C9CC**	**00**
	Enable Check C		**01**
	Enable Check K		**02**
	Enable Check C and K		**03**
Check Tx	Disable	**C9CT**	**00**
	Enable		**01**

w = Hex value from **00** to **4A** representing the decimal number

v = Hex value from **00** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Decoding Options			
Minimum Reads	One Read	**C9MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**C9DL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**C9CO**	**00**
	Enable		**01**
Quiet Zones	No Quiet Zones	**C9LO**	**00**
	Quiet Zone on One Side		**01**
	Quiet Zones on Two Sides		**02**
	Auto		**03**
	Virtual Quiet Zones on Two Sides		**04**
Stitching	Disable	**C9ST**	**00**
	Enable		**01**

CODE SELECTION			
Description		**Parameter**	**Value**
MSI			
MSI	Disable	**MSEN**	**00**
	Enable		**01**
Code Length Control	Variable	**MSLC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**MSL1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**MSL2**	***v***
Check Options			
Check Calculation	Disable	**MSCC**	**00**
	Enable Mod 10		**01**
	Enable Mod 11/10		**02**
	Enable Mod 10/10		**03**
Check Tx	Disable	**MSCT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**MSMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**MSDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Stitching	Disable	**MSST**	**00**
	Enable		**01**

v = Hex value from **00** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Plessey			
Plessey	Disable	**PLEN**	**00**
	Enable		**01**
Code Length Control	Variable	**PLLC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**PLL1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**PLL2**	***v***
Check Options			
Check Calculation	Disable	**PLCC**	**00**
	Plessey Standard Check		**01**
	Anker Check		**02**
Check Tx	Disable	**PLCT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**PLMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**PLDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**PLCO**	**00**
	Enable		**01**
Stitching	Disable	**PLST**	**00**
	Enable		**01**

v = Hex value from **00** to **32** representing the decimal number

4 BARCODE CONFIGURATION

An alternative configuration method for your TC1200 is by reading configuration barcodes.

4.1 INITIAL SETUP

The following procedure prepares your TC1200 to read barcodes using the default settings.

For TC1200 Scanner models just press the Trigger button to read a code.

NOTE	*TC1200 Scan Engine models require hardware connections to trigger barcode reading.* • *For RS232 Scan Engine models see the "Input" paragraph under Scan Engine Electrical Connections.* • *For USB Scan Engine models you can trigger the reader as shown in par. 2.2.3.*

RESTORE DEFAULT

1. Read the restore factory default parameters code below.

Restore TC1200 Current Interface (Custom) Default

INTERFACE SELECTION

2. Read the interface selection code for your application.

Only RS232 Models

RS232

Only USB Models

◆ USB-COM

USB-KBD

USB-KBD-ALT

USB-KBD-APPLE

YOUR READER IS NOW READY TO READ BARCODES.

To change the default settings see par. 4.2.

4.2 CHANGING DEFAULT SETTINGS

Once your reader is setup, you can change the default parameters to meet your application needs. Refer to the preceding paragraph for initial configuration in order to set the default values and select the interface for your application.

In this manual, the configuration parameters are divided into logical groups making it easy to find the desired function based on its reference group.

The first three groups are for Standard Interface parameter configuration:

- **RS232**
- **RS232/USB-COM**
- **USB-KBD**

The following parameter groups are common to all interface applications:

READING PARAMETERS control various operating modes and indicator status functioning.

DATA FORMAT parameters regard the messages sent to the Host system for all interfaces.

DIGITAL OUTPUTS manage the events controlling the two digital outputs.
(RS232 models only)

POWER SAVE manages overall current consumption in the reading device.

CODE SELECTION parameters allow configuration of a personalized mix of codes, code families and their options.

GLOBAL INTERFACE FEATURES

◆ **Obey Host Commands**

Ignore Host Commands

RS232

⊙ ***BAUD RATE*** ⊙

⊙ ***PARITY*** ⊙

⊙ ***DATA BITS*** ⊙

⊙ ***STOP BITS*** ⊙

1. Read the **Enter**/Exit **Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

☞ = Read the code and follow the procedure on the indicated reference page

◆ = Default value

3. Read the Enter/**Exit Configuration** code ONCE, available at the top of each page.

BAUD RATE

1200 baud

2400 baud

4800 baud

◆ 9600 baud

19200 baud

38400 baud

57600 baud

115200 baud

PARITY

◆ none

even

odd

DATA BITS

7 bits

8 bits

STOP BITS

◆ 1 stop bit

2 stop bits

RS232/USB-COM

⦿ ***INTERCHARACTER DELAY*** ⦿
⦿ ***DISABLE CHARACTER*** ⦿
⦿ ***ENABLE CHARACTER*** ⦿
⦿ ***ACK/NAK OPTIONS*** ⦿
⦿ ***ACK CHARACTER*** ⦿
⦿ ***NAK CHARACTER*** ⦿
⦿ ***ACK/NAK TIMEOUT*** ⦿
⦿ ***ACK/NAK RETRY COUNT*** ⦿
⦿ ***ACK/NAK ERROR HANDLING*** ⦿

1. Read the **Enter**/Exit **Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

   ☞ = Read the code and follow the procedure on the indicated reference page

   ◆ = Default value

3. Read the Enter/**Exit Configuration** code ONCE, available at the top of each page.

INTERCHARACTER DELAY

◆ No Delay

Select Intercharacter Delay

See page 129

DISABLE CHARACTER

Select Device Disable Character

See page 129

ENABLE CHARACTER

Select Device Enable Character

See page 130

ACK/NAK OPTIONS

◆ Disable

Enable For Label Transmission

Enable For Host Command Acknowledge

Enable For Label Transmission And Host Command Acknowledge

ACK CHARACTER

Select ACK Character

See page 131

NAK CHARACTER

Select NAK Character

See page 131

ACK/NAK TIMEOUT

◆ No Timeout

Select ACK/NAK Timeout Value

See page 132

ACK/NAK RETRY COUNT

Select Retry Count

See page 132

ACK/NAK ERROR HANDLING

Ignore Errors Detected

Process Errors As Valid ACK Character

Process Errors As Valid NAK Character

USB-KBD

⊙	***KEYBOARD COUNTRY***	⊙
⊙	***CAPS LOCK***	⊙
⊙	***NUM LOCK***	⊙
⊙	***INTER-CHARACTER DELAY***	⊙
⊙	***INTER-CODE DELAY***	⊙
⊙	***KEYBOARD SETTING***	⊙
⊙	***CONTROL CHARACTER EMULATION***	⊙

1. Read the **Enter**/Exit **Configuration** code <u>ONCE</u>, available at the top of each page.

2. Read configuration codes from the desired groups.

    = Read the code and follow the procedure on the indicated reference page

   ◆ = Default value

3. Read the Enter/**Exit Configuration** code <u>ONCE</u>, available at the top of each page.

KEYBOARD COUNTRY

◆ US

Belgium

Britain

Croatia

Czech Repubblic

Denmark

France

Germany

Hungary

Italy

Japanese (106 key)

Norway

KEYBOARD COUNTRY (CONTINUED)

Poland

Portugal

Romania

Slovakia

Spain

Sweden

Switzerland

KEYBOARD INTERCODE DELAY

◆ No Delay

See page 133

Select Intercode Delay

SEND CONTROL CHARACTERS

◆ CTRL + Key

CTRL + SHIFT + Key

Special Function Key

USB KEYBOARD SPEED

◆ 1 ms

2 ms

3 ms

4 ms

5 ms

6 ms

7 ms

8 ms

USB KEYBOARD SPEED (CONTINUED)

9 ms

10 ms

READING PARAMETERS

⦿ *ILLUMINATION MODE* ⦿
⦿ *OPERATING MODE* ⦿
⦿ *AUTOMATIC THRESHOLD* ⦿
⦿ *PHASE OFF EVENT* ⦿
⦿ *TIMEOUT* ⦿
⦿ *SERIAL START* ⦿
⦿ *SERIAL STOP* ⦿
⦿ *LED INDICATION* ⦿
⦿ *LABEL PROGRAMMING MODE* ⦿
⦿ *EXPOSURE MODE* ⦿
⦿ *READING CONDITIONS* ⦿

1. Read the **Enter**/Exit **Configuration** code <u>ONCE</u>, available at the top of each page.

2. Read configuration codes from the desired groups.

   ☞ = Read the code and follow the procedure on the indicated reference page

   ◆ = Default value

3. Read the Enter/**Exit Configuration** code <u>ONCE</u>, available at the top of each page.

ILLUMINATION MODE

Disabled

◆ Triggered

Enabled

OPERATING MODE

◆ On Line

Serial On Line

Automatic

Automatic (Object Sense)

Test

AUTOMATIC THRESHOLD

Select Automatic Threshold

See page 134

PHASE OFF EVENT

◆ **Trigger Stop**

Timeout

Trigger Stop - Timeout

TIMEOUT

Select Timeout

See page 135

SERIAL START

Select Serial Start Characters

See page 136

SERIAL STOP

Select Serial Stop Characters

See page 136

LED INDICATION

◆ **On Decode**

After Transmission

LABEL PROGRAMMING MODE

Disabled

◆ Enabled

EXPOSURE MODE

◆ Continuous

Strobed

READING CONDITIONS

◆ Auto

Standard

High Resolution (Far)

Difficult

Blurred (Near)

DATA FORMAT

1. Read the **Enter**/Exit **Configuration** code <u>ONCE</u>, available at the top of each page.

2. Read configuration codes from the desired groups.

   ☞ = Read the code and follow the procedure on the indicated reference page

   ◆ = Default value

3. Read the Enter/**Exit Configuration** code <u>ONCE</u>, available at the top of each page.

DATA TRANSMISSION

◆ On Decode

After Phase Off

CODE VERIFIER MODE

◆ Disabled

Transmit Wrong String

Transmit Wrong Code

MATCH STRING

Select Match String

See page 144

WRONG CODE STRING

Select Wrong Code String

See page 144

CASE CONVERSION

◆ Disable (no case conversion)

Convert To Upper Case

Convert To Lower Case

GLOBAL PREFIX

Select Global Prefix (Header)

See page 139

GLOBAL SUFFIX

Select Global Suffix (Terminator)

See page 139

NO READ STRING

Select No Read String

See page 140

TRANSMIT AIM IDS

◆ Disable

Enable

TRANSMIT CUSTOM LABEL IDS

◆ Disabled

Prefix

Suffix

CUSTOM LABEL IDENTIFIERS

Set UPC-A Label ID(s)

See page 142

Set UPC-E Label ID(s)

See page 142

Set EAN-8 Label ID(s)

See page 142

Set EAN-13 Label ID(s)

See page 142

CUSTOM LABEL IDENTIFIERS (CONTINUED)

Set UPC-A/P2 Label ID(s)

See page 142

Set UPC-A/P5 Label ID(s)

See page 142

Set UPC-E/P2 Label ID(s)

See page 142

Set UPC-E/P5 Label ID(s)

See page 142

Set EAN-8/P2 Label ID(s)

See page 142

Set EAN-8/P5 Label ID(s)

See page 142

Set EAN-13/P2 Label ID(s)

See page 142

Set EAN-13/P5 Label ID(s)

See page 142

Set ISBN Label ID(s)

See page 142

Set ISSN Label ID(s)

See page 142

CUSTOM LABEL IDENTIFIERS (CONTINUED)

Set GTIN Label ID(s) for EAN/UPC without Add-Ons

See page 142

Set GTIN Label ID(s) for EAN/UPC with P2

See page 142

Set GTIN Label ID(s) for EAN/UPC with P5

See page 142

Set Code 39 Label ID(s)

See page 142

Set Code 32 Label ID(s)

See page 142

Set Code 128 Label ID(s)

See page 142

Set GS1-128 Label ID(s)

See page 142

Set ISBT 128 Label ID(s)

See page 142

Set Interleaved 2 of 5 Label ID(s)

See page 142

Set Standard 2 of 5 Label ID(s)

See page 142

Set Codabar Label ID(s)

See page 142

Set ABC Codabar Label ID(s)

See page 142

CUSTOM CODE IDENTIFIERS (CONTINUED)

Set Code 11 Label ID(s)

See page 142

Set Label ID(s) for GS1 Databar 14 (Omnidirectional)

See page 142

Set Label ID(s) for GS1 Databar Expanded

See page 142

Set Label ID(s) for GS1 Databar Limited

See page 142

Set Code 93 Label ID(s)

See page 142

Set MSI Label ID(s)

See page 142

DIGITAL OUTPUTS

⦿ ***OUTPUT 1 ACTIVATION EVENT*** ⦿
⦿ ***OUTPUT 1 DEACTIVATION EVENT*** ⦿
⦿ ***OUTPUT 1 DEACTIVATION TIMEOUT*** ⦿
⦿ ***OUTPUT 1 ACTIVE LEVEL*** ⦿
⦿ ***OUTPUT 2 ACTIVATION EVENT*** ⦿
⦿ ***OUTPUT 2 DEACTIVATION EVENT*** ⦿
⦿ ***OUTPUT 2 DEACTIVATION TIMEOUT*** ⦿
⦿ ***OUTPUT 2 ACTIVE LEVEL*** ⦿

1. Read the **Enter**/Exit **Configuration** code <u>ONCE</u>, available at the top of each page.

2. Read configuration codes from the desired groups.

 = Read the code and follow the procedure on the indicated reference page

◆ = Default value

3. Read the Enter/**Exit Configuration** code <u>ONCE</u>, available at the top of each page.

OUTPUT 1 ACTIVATION EVENT

Disable

Good Read

No Read

Wrong Code

OUTPUT 1 DEACTIVATION EVENT

Disable

Timeout

Reading Phase Active

OUTPUT 1 DEACTIVATION TIMEOUT

Set Deactivation Timeout

See page 145

OUTPUT 1 ACTIVATION EVENT

Closed

Open

OUTPUT 2 ACTIVATION EVENT

Disable

Good Read

No Read

Wrong Code

OUTPUT 2 DEACTIVATION EVENT

Disable

Timeout

Reading Phase Active

OUTPUT 2 DEACTIVATION TIMEOUT

Set Deactivation Timeout

See page 145

OUTPUT 2 ACTIVATION EVENT

Closed

Open

POWER SAVE

⊙ ***SLEEP MODE TIMEOUT*** ⊙

1. Read the **Enter**/Exit **Configuration** code ONCE, available at the top of each page.

2. Read configuration codes from the desired groups.

☞ = Read the code and follow the procedure on the indicated reference page

◆ = Default value

3. Read the Enter/**Exit Configuration** code ONCE, available at the top of each page.

SLEEP MODE TIMEOUT

Disable

10 Seconds

30 Seconds

1 Minute

5 Minutes

10 Minutes

CODE SELECTION

⦿ *POSITIVE/NEGATIVE BACKGROUND* ⦿
⦿ *EAN/UPC* ⦿
⦿ *CODE 39 (CODE 32)* ⦿
⦿ *CODE 128 (GS1-128, ISBT 128)* ⦿
⦿ *INTERLEAVED 2 OF 5* ⦿
⦿ *STANDARD 2 OF 5* ⦿
⦿ *INDUSTRIAL 2 OF 5* ⦿
⦿ *CODABAR (ABC CODABAR)* ⦿
⦿ *CODE 11* ⦿
⦿ *GS1 DATABAR (OMNIDIRECTIONAL, EXPANDED, LIMITED)* ⦿
⦿ *CODE 93* ⦿
⦿ *MSI* ⦿
⦿ *PLESSEY* ⦿

1. Read the **Enter**/Exit **Configuration** code ONCE, available at the top of each page.
2. Read configuration codes from the desired groups.

   ☞ = Read the code and follow the procedure on the indicated reference page

   ◆ = Default value

3. Read the Enter/**Exit Configuration** code ONCE, available at the top of each page.

CODE SELECTION

DISABLE ALL CODE SYMBOLOGIES

Use this feature to disable all symbologies.

1. Scan the ENTER/EXIT PROGRAMMING barcode above.
2. Scan the Disable All Symbologies barcode.
3. Complete the programming sequence by re-scanning the ENTER/EXIT PROGRAMMING barcode above.

Disable All Code Symbologies

POSITIVE / NEGATIVE BACKGROUND

Positive

Negative

Both

UPC-A

Disable

Enable

CHECK CHARACTER TX

Disable

Enable

EXPAND TO EAN-13

Disable

Enable

NUMBER SYSTEM TX

Disable

Enable

UPC-A MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

COUPON CONTROL

Allow All Coupon Barcodes to be Decoded

Enable Only UPC-A Coupon Decoding

Enable Only GS1 Databar Coupon Decoding

UPC-E

Disable

Enable

CHECK CHARACTER TX

Disable

Enable

EXPAND TO UPC-A

Disable

Enable

EXPAND TO EAN-13

Disable

Enable

NUMBER SYSTEM TX

Disable

Enable

UPC-E MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

EAN-13

Disable

Enable

CHECK CHARACTER TX

Disable

Enable

ISBN CONVERSION

Disable

Enable

ISSN CONVERSION

Disable

Enable

FLAG 1 CHARACTER

Disable

Enable

EAN-13 MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

COUPON CONTROL

Allow All Coupon Barcodes to be Decoded

Enable Only UPC-A Coupon Decoding

Enable Only GS1 Databar Coupon Decoding

EAN-8

Disable

Enable

CHECK CHARACTER TX

Disable

Enable

EXPAND TO EAN-13

Disable

Enable

EAN-8 MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

ENABLE OPTIONAL P2 ADD-ON

Disable

Enable

ENABLE OPTIONAL P5 ADD-ON

Disable

Enable

P2 MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

P5 MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

OPTIONAL ADD-ON TIMER

Add-On Timer Disable

See page 146

Set Add-On Timer Value

GTIN FORMAT

Disable

Enable

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

IN-STORE MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

CODE 39

Disable

Enable

CODE 39 FULL ASCII

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1 (or Minimum Length)

See page 149

See page 150

Set Length 2 (or Maximum Length)

CODE 39 CHECK TX

Disable

Enable

CODE 39 START/STOP TX

Disable

Enable

CODE 32 (ITALIAN PHARMACEUTICAL)

Disable

Enable

CODE 32 CHECK TX

Disable

Enable

CODE 32 START/STOP TX

Disable

Enable

Code 39 Check Options

CHECK CALCULATION

Disable

Enable Standard Check

Enable Mod-7 Check

Enable Italian Post Check

Enable Daimler Chrysler Check

Code 39 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

INTERDIGIT RATIO

Accept Any Interdigit Ratio

See page 147

Set Interdigit Ratio

QUIET ZONES

Quiet Zone on One Side

Quiet Zones on Two Sides

Auto

Virtual Quiet Zones on Two Sides

Small Quiet Zones on Two Sides

STITCHING

Disable

Enable

CODE 128

Disable

Enable

GS1-128 ENABLE

Enable GS1-128 (Transmit Labels in Code 128 Data Format)

Enable GS1-128 (Transmit Labels in GS1-128 Data Format)

Disable GS1-128

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1 (or Minimum Length)

See page 149

See page 150

Set Length 2 (or Maximum Length)

EXPAND TO CODE 39

Disable

Enable

Code 128 Check Options

CHECK TX

Disable

Enable

FUNCTION CHARACTER TX

Disable

Enable

SUB-CODE CHANGE TX

Disable

Enable

Code 128 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

QUIET ZONES

No Quiet Zones

Quiet Zone on One Side

Quiet Zones on Two Sides

Auto

Virtual Quiet Zones on Two Sides

STITCHING

Disable

Enable

ISBT 128 CONCATENATION

Disable

Enable

CONCATENATION MODE

Static

Dynamic

DYNAMIC CONCATENATION TIMEOUT

Set Timeout

See page 148

INTERLEAVED 2 OF 5

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

Enter/Exit Configuration

Interleaved 2 of 5 Check Options

CHECK CALCULATION

Disable

Enable Standard (Mod 10) Check

Enable German Parcel Check

Enable DHL Check

Enable Daimler Chrysler Check

Enable Bosch Check

Enable Italian Post Check

CHECK TX

Disable

Enable

Interleaved 2 of 5 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

STITCHING

Disable

Enable

ZERO PATTERN

Disable

Enable

STANDARD 2 OF 5

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

Standard 2 of 5 Check Options

CHECK CALCULATION

Disable

Enable

CHECK TX

Disable

Enable

Standard 2 of 5 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

STITCHING

Disable

Enable

INDUSTRIAL 2 OF 5

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

Industrial 2 of 5 Check Options

CHECK CALCULATION

Disable

Enable

CHECK TX

Disable

Enable

Industrial 2 of 5 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

CHARACTER CORRELATION

Disable

Enable

STITCHING

Disable

Enable

CODABAR

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

CODABAR ABC

Disable

Enable

CONCATENATION MODE

Static

Dynamic

DYNAMIC CONCATENATION TIMEOUT

Set Timeout

See page 148

Codabar Check Options

CHECK CALCULATION

Disable

Enable AIM Standard Check

Enable Mod-10 Check

CHECK TX

Disable

Enable

START/STOP SET

ABCD/TN*E

ABCD/ABCD

abcd/tn*e

abcd/abcd

START/STOP TX

Disable

Enable

START/STOP MATCH

Disable

Enable

Codabar Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

INTERDIGIT RATIO

Accept Any Interdigit Ratio

See page 147

Set Interdigit Ratio

QUIET ZONES

Quiet Zone on One Side

Quiet Zones on Two Sides

Auto

Virtual Quiet Zones on Two Sides

Small Quiet Zones on Two Sides

STITCHING

Disable

Enable

CODE 11

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

Code 11 Check Options

CHECK CALCULATION

Disable

Enable Check C

Enable Check K

Enable Check C and K

CHECK TX

Disable

Enable

Code 11 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

INTERDIGIT RATIO

Accept Any Interdigit Ratio

See page 147

Set Interdigit Ratio

STITCHING

Disable

Enable

GS1 DATABAR OMNIDIRECTIONAL

Disable

Enable

GS1 DATABAR OMNIDIRECTIONAL GS1-128 EMULATION

Disable

Enable

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

GS1 DATABAR EXPANDED

Disable

Enable

GS1 DATABAR EXPANDED GS1-128 EMULATION

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

GS1 DataBar Expanded Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

COUPON CONTROL

Allow All Coupon Barcodes to be Decoded

Enable Only UPC-A Coupon Decoding

Enable Only GS1 Databar Coupon Decoding

GS1 DATABAR LIMITED

Disable

Enable

GS1 DATABAR LIMITED GS1-128 EMULATION

Disable

Enable

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

CODE 93

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

Set Length 2
(or Maximum Length)

See page 150

Code 93 Check Options

CHECK CALCULATION

Disable

Enable Check C

Enable Check K

Enable Check C and K

CHECK TX

Disable

Enable

Code 93 Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

QUIET ZONES

No Quiet Zones

Quiet Zone on One Side

Quiet Zones on Two Sides

Auto

Virtual Quiet Zones on Two Sides

STITCHING

Disable

Enable

MSI

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

MSI Check Options

CHECK CALCULATION

Disable

Enable Mod 10 Check

Enable Mod 11/10 Check

Enable Mod 10/10 Check

CHECK TX

Disable

Enable

MSI Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

STITCHING

Disable

Enable

PLESSEY

Disable

Enable

CODE LENGTH CONTROL

Variable

Fixed

SET LENGTH

Set Length 1
(or Minimum Length)

See page 149

See page 150

Set Length 2
(or Maximum Length)

Plessey Check Options

CHECK CALCULATION

Disable

Plessey Standard Check

Anker Check

CHECK TX

Disable

Enable

Plessey Decoding Options

MINIMUM READS

One Read

Two Reads

Three Reads

Four Reads

DECODING LEVEL

Disable

Level 1

Level 2

Level 3

Level 4

Level 5

CHARACTER CORRELATION

Disable

Enable

STITCHING

Disable

Enable

5 PARAMETER REFERENCES

5.1 RS232 PARAMETERS

This section contains explanations and examples of selected barcode features. See the Configuration section for the actual barcode labels used to configure the reader.

5.1.1 RS232 Only

Baud Rate

Baud rate is the number of bits of data transmitted per second. Set the reader's baud rate to match the baud rate setting of the host device. With an improper baud rate setting, data may not reach the host correctly.

Stop Bits

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. The number of stop bits selected (one or two) depends on the number the receiving terminal is programmed to accommodate. Set the number of stop bits to match host device requirements.

Parity

This feature specifies parity required for sending and receiving data. A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

- Select None when no parity bit is required.
- Select Odd parity and the parity bit value is set to 0 or 1, based on data, to ensure that an odd number of 1 bits are contained in the coded character.
- Select Even parity and the parity bit value is set to 0 or 1, based on data, to ensure that an even number of 1 bits are contained in the coded character.

5.1.2 RS232/USB COM Parameters

Intercharacter Delay

This parameter specifies the intercharacter delay between the end of one character and the beginning of the next. The delay can be set within a range of zero (0) to 990 milliseconds in 10 ms increments. A setting of zero specifies no delay.

To set the delay:

1. Determine the desired setting in milliseconds (x 10 ms). (0-99).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 48 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT INTERCHARACTER DELAY.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit.

This completes the procedure.

Disable Character

Specifies the value of the RS232 host command used to disable the reader. Selections: a character from NUL (0x00) to DEL (0x7F).

NOTE	*The Enable Character must be different from the Disable Character and must not contain reserved characters (see Appendix D). Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option Data Bits has been set as 7 Data Bits.*

To set the value:

1. Determine the desired character. A setting of 0xFF indicates the Disable Character is not used (not available).
2. Use the Chart in Appendix C to find the hex equivalent for the desired character.
3. Go to page 48 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT DEVICE DISABLE CHARACTER.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the desired character in step 1 above.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Enable Character

Specifies the value of the RS232 host command used to enable the reader. Selections: a character from NUL (0x00) to DEL (0x7F).

> **NOTE**
>
> *The Enable Character must be different from the Disable Character and must not contain reserved characters (see Appendix D). Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option Data Bits has been set as 7 Data Bits.*

To set this feature:

1. Determine the desired character. A setting of 0xFF indicates the Enable Character is not used (not available).
2. Use the Chart in Appendix C to find the hex equivalent for the desired character.
3. Go to page 48 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT DEVICE ENABLE CHARACTER.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the desired character in step 1 above.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

ACK NAK Options

This enables/disables the ability of the reader to support the RS232 ACK/NAK protocol. When configured, the reader and/or host sends an “ACK” when it receives data properly, and sends “NAK” when the data is in error.

Options are:

- Disable
- Enable for label transmission — The reader expects an ACK/NAK response from the host when a label is sent.
- Enable for host-command acknowledge — The reader will respond with ACK/NAK when the host sends a command.
- Enable for label transmission and host-command acknowledge

ACK Character

This setting specifies an ASCII character to be used as the ACK character. Selections: a character from NUL (0x00) to DEL (0x7F).

NOTE	*The ACK Character must be different from the NAK Character and must not contain reserved characters (see Appendix D). Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option Data Bits has been set as 7 Data Bits.*

To set this feature:

1. Determine the desired character.
2. Use the Chart in Appendix C to find the hex equivalent for the desired character.
3. Go to page 48 and scan the ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT ACK CHARACTER.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the desired character in step 1 above.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

NAK Character

This setting specifies an ASCII character to be used as the NAK character. Selections: a character from NUL (0x00) to DEL (0x7F).

NOTE	*The ACK Character must be different from the NAK Character and must not contain reserved characters (see Appendix D). Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option Data Bits has been set as 7 Data Bits.*

To set this feature:

1. Determine the desired character.
2. Use the Chart in Appendix C to find the hex equivalent for the desired character.
3. Go to page 49 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT NAK CHARACTER.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the desired character in step 1 above.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

ACK NAK Timeout Value

This option specifies the amount of time the reader waits for an ACK character from the host following label transmission. The selectable timeout range is 200 ms to 15,000 ms (15 seconds) in 200 ms increments. A selection of 0 disables the timeout.

To set this value:

1. Determine the desired setting in milliseconds (x 200 ms). (0-75).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 49 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT ACK NAK TIMEOUT VALUE.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

ACK NAK Retry Count

This feature specifies the number of times the reader retries a label transmission due to a retry condition. The selectable range is from 1 to 254 retries. A selection of 0 disables the count (no retries), and a selection of 255 specifies unlimited retries.

To set this feature:

1. Determine the desired number of retries. (0-255).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 49 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT ACK NAK RETRY COUNT.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Keyboard Intercode Delay

This parameter specifies the intercode delay between the end of one code and the beginning of the next. The delay can be set within a range of zero (0) to 99 seconds in 1 second increments. A setting of zero specifies no delay.

To set the delay:

1. Determine the desired setting in seconds. (0-99).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 52 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT INTERCODE DELAY.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit.

This completes the procedure.

5.2 READING PARAMETERS

5.2.1 Illumination Mode

Illumination Mode

Selects the illumination mode for the reader. The illumination mode can be used to:

- to increase the overall diode life
- to reduce power consumption;
- to turn off the illuminator for safety purposes.

Selections:

Disabled: the illuminator is always off.

Enabled: the illuminator is always on.

Triggered: the illuminator is turned on when the reading phase starts. The illuminator is turned off as soon as the code(s) are read or when the reading phase ends.

NOTE	*The Triggered selection is ignored for Automatic and Test Operating Modes.*

5.2.2 Operating Mode

Operating Mode

Selects the scan operating mode for the reader. Selections:

On Line: the reading phase is defined as the time between the Phase ON and Phase OFF events. The Phase events can be signals coming from the trigger button (or external presence sensor connected to the scanner input for RS232 models).

Serial On Line: the reading phase is defined as the time between the Phase ON and Phase OFF events. The Phase events are serial start/stop strings sent from the host over the serial interface.

Automatic: The device does not require connections with external presence sensors in this operating mode. In this mode the scanner is continuously scanning. The reading phase is enabled when a barcode enters the reading zone of the scanner and is terminated after an N number of scans without a code, where N is set using the Automatic Threshold selection. The next reading phase will begin when a code enters the reading zone of the scanner again. The N number of scans without a code must be selected to assure code identification in the reading zone. Code transmission is identical to the other operating modes except that there is no transmission on the serial port in the case of a No Read condition.

Automatic (Object Sense):The reader is normally in the Object Sense state (a low power/ready-to-read condition). When an item is automatically detected in the reader's field of view, the Automatic operating mode is turned on. The Automatic Threshold assures code identification. When objects are no longer present in the reading field, the Timeout ends Automatic mode and returns the reader to the Object Sense state.

Test: The Test mode reports information about the reading performance of the scanner and the code is continuously read. After 100 scans, the following information is transmitted on the serial interface:

- the code content
- percentage of good reads (if the good read percentage is 0 no transmission is done)

The information can be displayed on the Host PC by running a terminal emulator program (ex. Hyper Terminal). The output data format is fixed.

Automatic Threshold

For Automatic operating modes, the Automatic Threshold sets an N number of scans without a code in order to assure code identification in the reading zone. Selection: a value from 2 to 255.

To set this value:

1. Determine the desired number of reads. (2-255).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 56 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT AUTOMATIC THRESHOLD VALUE.

5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Phase Off Event

This parameter determines how the reading phase is concluded for On Line and Serial On Line modes:

Trigger Stop: the reading phase ends only when a Stop Input or Serial Stop String is received; the Timeout is disabled.

Timeout: the reading phase ends only when the Timeout expires; Stop Input or Serial Stop Strings are ignored.

Trigger Stop-Timeout: the Stop Input or Serial Stop Strings define the end of the reading phase. If no Stop Input or Serial Stop String is received then the Timeout ends the reading phase.

Timeout

Determines the Timeout for a Phase Off Event or Automatic Object Sense state as follows.

For On Line and Serial On Line modes, it defines a timeout which determines the maximum length of the reading phase depending on the Phase Off Event selection.

For Automatic (Object Sense) mode, it defines a timeout which allows the reader to return to the Object Sense state after objects are no longer present in the reading field.

Selections: from 40 to 5100 ms in 20 ms increments.

To set this value:

1. Determine the desired setting in milliseconds (x 20 ms). (2-255).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 57 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT TIMEOUT VALUE.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Serial Start

The Serial Start string (max 20 characters), signals the beginning of the reading phase. Selections: characters from NUL (0x00) to ~ (0x7E).

NOTE	*The Serial Start Character must be different from the Serial Stop Character and must not contain reserved characters (see Appendix D). Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option Data Bits has been set as 7 Data Bits.*

To set this feature:

1. Determine the desired character string (max 20).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
3. Go to page 57 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT SERIAL START CHARACTERS.
5. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 1 above.
6. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Serial Stop

The Serial Stop string (max 20 characters), signals the end of the reading phase. Selections: characters from NUL (0x00) to ~ (0x7E).

NOTE	*The Serial Start Character must be different from the Serial Stop Character and must not contain reserved characters (see Appendix D). Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option Data Bits has been set as 7 Data Bits.*

To set this feature:

1. Determine the desired character string (max 20).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
3. Go to page 57 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT SERIAL STOP CHARACTERS.
5. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 1 above.

6. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

5.2.3 Good Read LED

LED Indication

Specifies when the scanner will provide indication upon successfully reading a barcode. Selections:

On Decode = Indicate Good Read immediately after decoding.

After Transmission = Indicate Good Read after code transmission towards host.

5.2.4 Exposure Mode

This parameter allows controlling the lighting system for correct exposure according to the specific application. The lighting system can be set to low power (Continuous) or to high power (Strobed) lighting. Continuous lighting (default) is used for stopped or slow motion code reading applications.

When set to Strobed, the scanner controls the camera parameters dynamically in order to guarantee the best performance with high speed applications and low (or dark) external light conditions.

5.2.5 Preset Recipes

Reading Conditions

This parameter allows selecting various predefined "recipes" (combinations of internal component settings) to optimize the scanner to read under specific application conditions.

Auto: this is the default setting which cycles through all the predefined recipes attempting to find the best reading condition.

Standard: this setting is best for good quality codes at low resolutions.

High Resolution (Far): this optimizes reading for either high resolution codes or for codes located at the far end of the reading range for the given code resolution.

Difficult: optimizes low contrast code reading.

Blurred (Near): optimizes reading out of focus codes or codes located at the near end of the reading range for the given code resolution.

5.3 DATA FORMATTING

When a barcode is scanned, additional information can be sent to the host computer along with the barcode data. This combination of barcode data and supplementary user-defined data is called a "message string." The Data Editing features can be used to build specific user-defined data into a message string.

There are several types of selectable data characters that can be sent before and after scanned data. You can specify if they should be sent with all symbologies, or only with specific symbologies. The figure below shows the available elements you can add to a message string:

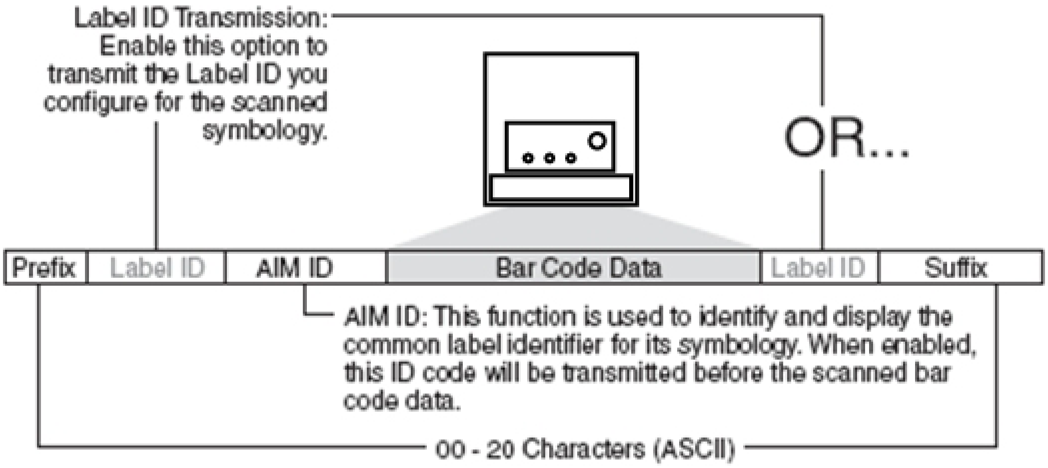


Figure 13 - Breakdown of a Message String

NOTE *Additional advanced formatting is available. See the Advanced Formatting features in the Datalogic Aladdin™ configuration software.*

Please Keep In Mind...

- Modifying a message string is not a mandatory requirement. Data editing is a sophisticated feature allowing highly customizable output for advanced users. Factory default settings for data editing is typically set to NONE.
- A prefix (header) or suffix (terminator) may be applied to all messages (set via the Global Prefix/Suffix feature).
- Label ID: Pre-loaded Set can be applied to all symbologies, as well as customizing specific Label IDs (set via the Label ID: Set Individually Per Symbology feature).
- You can add any character from the ASCII Chart (from 0x00 - 0xFF) in Appendix C as a Prefix, Suffix or Custom Label ID.
- Enter prefixes and suffixes in the order in which you want them to appear in the output.

5.3.1 Global Prefix/Suffix

Up to 20 ASCII characters may be added as a prefix (header) in a position before the barcode data, and/or as a suffix (terminator) in a position following the barcode data as indicated in the figure below.

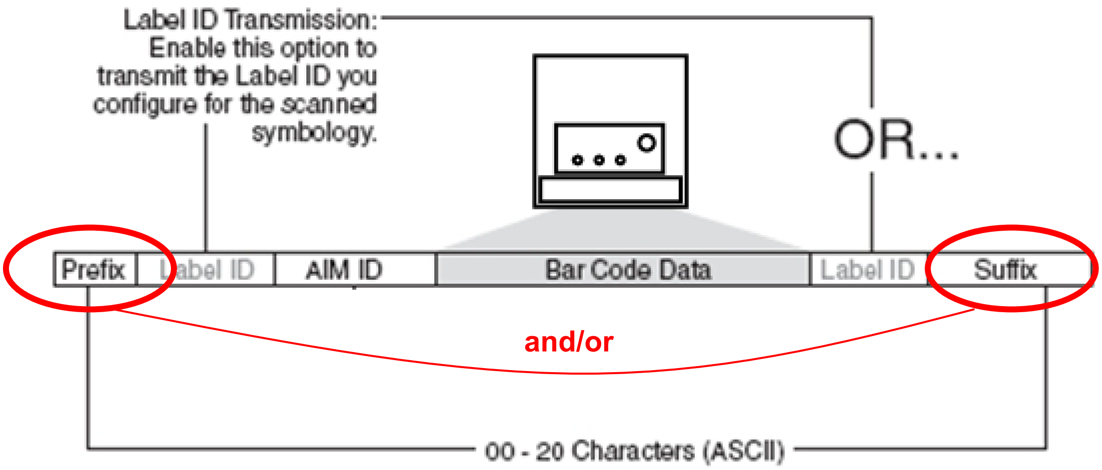


Figure 14 - Prefix and Suffix Positions

Example: Setting a Prefix

In this example, we'll set a prefix for all symbologies.

1. Determine which ASCII character(s) are to be added to scanned barcode data (max 20). In this example, we'll add a dollar sign ('$') as a prefix.
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
3. Go to page 61 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the SET GLOBAL PREFIX barcode.
5. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 1 above. The corresponding hex number for the '$' character is 24. To enter this selection code, scan the '2' and '4' barcodes from Appendix B.

NOTE *If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT barcode once again to exit Programming Mode.

The resulting message string would appear as follows:

Scanned barcode data:**12345**

Resulting message string output: **$12345**

No Read String

This defines the string to be displayed in case of No Read (On Line Mode only).

To set this feature:

1. Determine the desired character string (max 20).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
3. Go to page 61 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT NO READ STRING.
5. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 1 above.
6. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

5.3.2 Code Identifiers

Label IDs

A Label ID is a customizable code of up to three ASCII characters (each can be from 0x00 - 0xFF), used to identify a barcode (symbology) type. It can be appended previous to or following the transmitted barcode data depending upon how this option is enabled. This feature provides options for configuring custom Label IDs as a pre-loaded set (see "Label ID: Pre-loaded Set") or individually per symbology (see "Label ID: Set Individually Per Symbology").

If you wish to program the reader to always include an industry standard label identifier for ALL symbology types, see "Global AIM ID" on page 143.

Label ID: Pre-loaded Set

The reader supports a pre-loaded set of Label IDs. The following table shows this set.

BARCODE SYMBOLOGY	Factory Label ID Set	Custom
EAN 8	A	
EAN 8 with 2 Add On	J	
EAN 8 with 5 Add On	K	
EAN 13	B	
EAN 13 with 2 Add On	L	
EAN 13 with 5 Add On	M	
UPC A	C	
UPC A with 2 Add On	F	
UPC A with 5 Add On	G	
UPC E	D	
UPC E with 2 Add On	H	
UPC E with 5 Add On	I	
GTIN	$A	
GTIN with 2 Add On	$B	
GTIN with 5 Add On	$C	
Code 39	V	
Code 32	X	
Code 128	T	
GS1-128	k	
ISBN	@	
ISSN	n	
ISBT 128	f	
Interleaved 2 of 5	N	
Standard 2 of 5	P	
Codabar	R	
ABC Codabar	S	
Code 11	b	
GS1 Databar Omnidirectional	u	
GS1 Databar Expanded	t	
GS1 Databar Limited	v	
Code 93	U	
MSI	Z	

Label ID: Set Individually Per Symbology

To configure a Label ID individually for a single symbology:

1. Go to page 62 and scan the ENTER/EXIT barcode.
2. Select Label ID position as either BEFORE (Enable as Prefix) or AFTER (Enable as suffix) by scanning the appropriate barcode in the section "Transmit Custom Label IDs" on page 62. Reference the figure below for Label ID positioning options.
3. Scan a barcode to select the symbology for which you wish to configure a custom Label ID from the section "Custom Label Identifiers" starting on page 62.
4. Determine the desired character(s) (max 3) which will represent the Label ID for the selected symbology.
5. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
6. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 4 above. If you wish to select an equal sign, the corresponding hex number for the '=' character is 3D. To enter this selection code, scan the '3' and 'D' barcodes from Appendix B.

NOTE	*If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

7. If less than the expected string of 3 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
8. Scan the ENTER/EXIT barcode once again to exit Programming Mode.

This completes the steps to configure a Label ID for a given symbology.

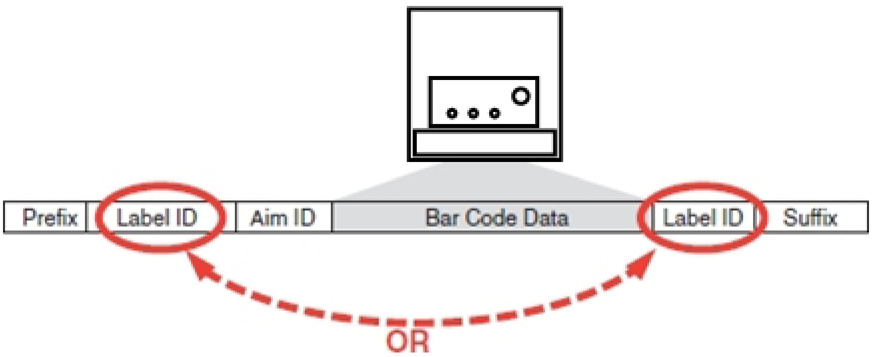


Figure 15 - Label ID Position Options

Global AIM ID

NOTE

This feature enables/disables addition of AIM IDs for all symbology types.

AIM label identifiers (as opposed to custom Label IDs you select yourself) can be included with scanned barcode data. AIM label identifiers consist of three characters as follows:

- A close brace character (ASCII ']'), followed by...
- A code character (see the table below), followed by...
- A modifier character (the modifier character is symbol dependent).

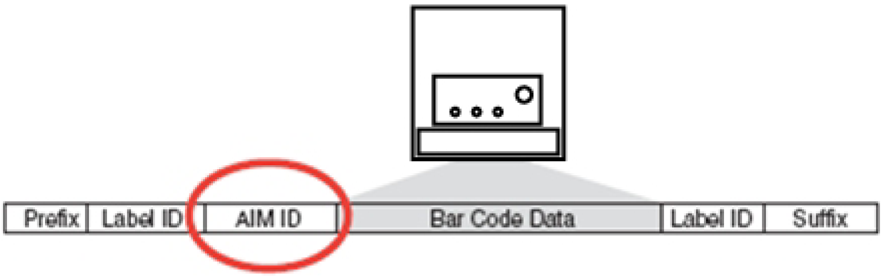


Figure 16 - AIM ID

AIM STANDARD IDENTIFIER TABLE

BARCODE SYMBOLOGY	AIM STANDARD	BARCODE SYMBOLOGY	AIM STANDARD
EAN 8	] E 4	Code 39	] A y
EAN 8 with 2 Add On	] E 5	Code 32	] X y
EAN 8 with 5 Add On	] E 6	Code 128	] C y
EAN 8 with GS1-128 Add On		GS1-128	] C y
EAN 13	] E 0	ISBN	] C4
EAN 13 with 2 Add On	] E 1	ISSN	] C4
EAN 13 with 5 Add On	] E 2	ISBT 128	] C4
EAN 13 with GS1-128 Add On		Interleaved 2 of 5	] I *y*
UPC A	] X y	Standard 2 of 5	] S y
UPC A with 2 Add On	] X y	Codabar	] F y
UPC A with 5 Add On	] X y	ABC Codabar	] X y
UPC-A with GS1-128 Add On		Code 11	] G y
UPC E	] X y	GS1 Databar Omnidirectional	] e y
UPC E with 2 Add On	] X y	GS1 Databar Expanded	] e y
UPC E with 5 Add On	] X y	GS1 Databar Limited	] e y
UPC-E with GS1-128 Add On		Code 93	] G y
GTIN	] E 0	MSI	] M y
GTIN with 2 Add On	] E 5		
GTIN with 5 Add On	] E 6		
GTIN with GS1-128 Add On	] E 2		

AIM standard identifiers are not defined for all codes: the X identifier is assigned to the code for which the standard is not defined. The *y* value depends on the selected options (check digit calculated or not, check digit tx or not, etc.).

5.3.3 Code Verifier

Match String

This is the string used as the match code for code verification. The Match String must be configured to include start/stop characters and check digits if their transmission is enabled.
It is possible to define the Match string by inserting:

- all printable characters
- non printable ASCII characters
- No wild card characters are supported

To set this feature:

1. Determine the desired character string (max 32).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
3. Go to page 60 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT MATCH STRING.
5. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 1 above.
6. If less than the expected string of 32 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Wrong Code String

This is the string sent in case of a mismatch (wrong code read).

To set this feature:

1. Determine the desired character string (max 20).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired character(s).
3. Go to page 60 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT WRONG CODE STRING.
5. Scan the hex equivalent characters from the keypad in Appendix B that represent the desired character string in step 1 above.
6. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

5.4 DIGITAL OUTPUTS

Activation Event

Defines the event activating the output.

Selections:

Disabled: the output is always in the selected idle state.

Good Read: the event occurs if the code is read.

No Read: the event occurs if no code is read.

Wrong Code: the event occurs if a code is successfully decoded but does not match the Verifier Code.

Deactivation Event

Defines the event deactivating the output.

Selections:

Timeout: the output deactivation event occurs after the deactivation timeout expires.

Reading Phase Active: the output deactivation event occurs, when a start reading phase event takes place.

Disabled: No deactivation event occurs.

Deactivation Timeout

When the Deactivation Event is Timeout, this indicates the maximum duration of the output pulse.

Active Level

Determines the active state of the output.

Each output can be represented as an NPN transistor; this transistor acts like a switch: so, when the transistor is OFF, it acts like an OPEN switch. On the contrary, when the transistor is ON, it acts like a CLOSED switch.

Selections:

Active Closed: the idle state of the output line is open, that is, the NPN transistor is OFF (like an open switch). When the output is activated, the transistor goes ON (like a closed switch).

Active Open: the idle state of the output line is closed, that is, the NPN transistor is ON (like a closed switch). When the output is activated, the transistor goes OFF (like an open switch).

5.5 POWER SAVE

Sleep Mode Timeout

Specifies the timeout value for the reader to enter low power Sleep Mode.

This is available only in On Line operating mode.

The reader wakes up when receiving an input signal or trigger button press. The reader cannot connect to Aladdin when in power save mode. It must first receive a wake up from the input signal or trigger button press.

5.6 CODE SELECTION

EAN-UPC Optional Add-On Timer

This option sets the time the reader will look for an add-on when an add-on fragment has been seen and optional add-ons are enabled.

To set this value:

1. Determine the desired setting in milliseconds (x 10 ms). (1-30).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to page 81 and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SET ADD-ON TIMER VALUE.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE

If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Decoding Level

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- **Level 1** results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- **Level 5** results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- **Level 3**, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.

Minimum Reads

This feature specifies the minimum number of consecutive times a label must be decoded before it is accepted as good read.

Interdigit Ratio

This feature specifies the ratio between an intercharacter space and module for given symbology labels.

To set this value:

1. Determine the desired ratio setting. (1-10).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to relative Code Symbology page and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SET INTERDIGIT RATIO.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

> **NOTE**
> *If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.*

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.

Stitching

This option enables/disables stitching for given symbology labels. When parts of a barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.

Quiet Zones

This feature specifies the number of quiet zones for given symbology labels. Quiet zones are blank areas at the ends of a barcode and are typically 10 times the width of the narrowest bar or space in the label.

5.6.1 Concatenation

Concatenation Mode

Specifies the concatenation mode between Static and Dynamic. Static requires the concatenated codes to be read in the same scan (simultaneously). Dynamic allows the two codes to be read separately (within the specified Dynamic Concatenation Timeout.

Dynamic Concatenation Timeout

Specifies the timeout in 10-millisecond ticks used by the Dynamic Concatenation Mode.

To set this value:

1. Determine the desired setting in milliseconds (x 10 ms). (5-255).
2. Use the Chart in Appendix C to find the hex equivalent for the desired numeric value.
3. Go to relative Dynamic Concatenation Timeout page and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SET TIMEOUT.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE

If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

5.6.2 Set Length

Length Control allows you to select either variable length decoding or fixed length decoding for the specified symbology.

- **Variable Length**: any length between a minimum and maximum length (inclusive).
- **Fixed Length**: one or two different fixed lengths

Set Length 1

This feature specifies one of the barcode lengths for Length Control. Length 1 is the minimum label length if in Variable Length Mode, or the first fixed length if in Fixed Length Mode.

The length that can be set varies, depending on the symbology, however Length 1 cannot be 0. Reference the page for your selected symbology to see specific variables.

NOTE

Code 39, Code 128, I 2/5, S 2/5, Code 11, Code 93, MSI
The specified length includes the check character (if any), data and ASCII shift characters. It does not include the start/stop characters.

NOTE

Codabar
The specified length includes the check character (if any), data and the start/stop characters.

Follow these instructions to set this feature:

1. Determine the desired character length (varies depending on symbology).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired numeric value.
3. Go to the Set Length page for your selected symbology and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode to SELECT LENGTH 1 SETTING for your selected symbology.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE

If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Set Length 2

This feature specifies one of the barcode lengths for Length Control. Length 2 is the maximum label length if in Variable Length Mode, or the second fixed length if in Fixed Length Mode.

The length that can be set varies depending on the symbology. For Fixed Length Mode, a setting of 0 specifies to ignore Length 2 (use only Length 1). Reference the page for your selected symbology to see specific variables.

NOTE

Code 39, Code 128, I 2/5, S 2/5, Code 11, Code 93, MSI
The specified length includes the check character (if any), data and ASCII shift characters. It does not include the start/stop characters.

NOTE

Codabar
The specified length includes the check character (if any), data and the start/stop characters.

Follow these instructions to set this feature:

1. Determine the desired character length (varies depending on symbology).
2. Use the Chart in Appendix C to find the hex equivalent(s) for the desired numeric value.
3. Go to the Set Length page for your selected symbology and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode to SELECT LENGTH 2 SETTING for your selected symbology.
5. Scan the two hex equivalent characters from the keypad in Appendix B that represent the numeric value determined in step 1 above.

NOTE

If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

6 MAINTENANCE

6.1 CLEANING

Clean the reading window periodically for continued correct operation of the reader.

Dust, dirt, etc. on the window may alter the reading performance.

Repeat the operation frequently in particularly dirty environments.

Use soft material and alcohol to clean the window and avoid any abrasive substances.

WARNING	*Clean the window of the TC1200 when the reader is turned off.*

7 TECHNICAL FEATURES

Electrical Features	**RS232**	**USB**
Power supply	5 Vdc ± 5%	
Consumption	350 mA; 1.75 W	
Interfaces	RS232, USB	
Inputs Input 1 (External Trigger), Voltage Current Consumption Minimum Pulse Duration	Optocoupled, polarity insensitive 5 to 30 Vdc 9 mA max. 5 ms	
Outputs Output 1, Output 2 V_{CE} Collector Current $V_{CE\ Saturation}$ Power Dissipation	Optocoupled 30 Vdc max. 40 mA continuous max.; 130 mA pulsed max. 1V max. at 10 mA 80 mW max. at 45 °C (ambient temperature)	

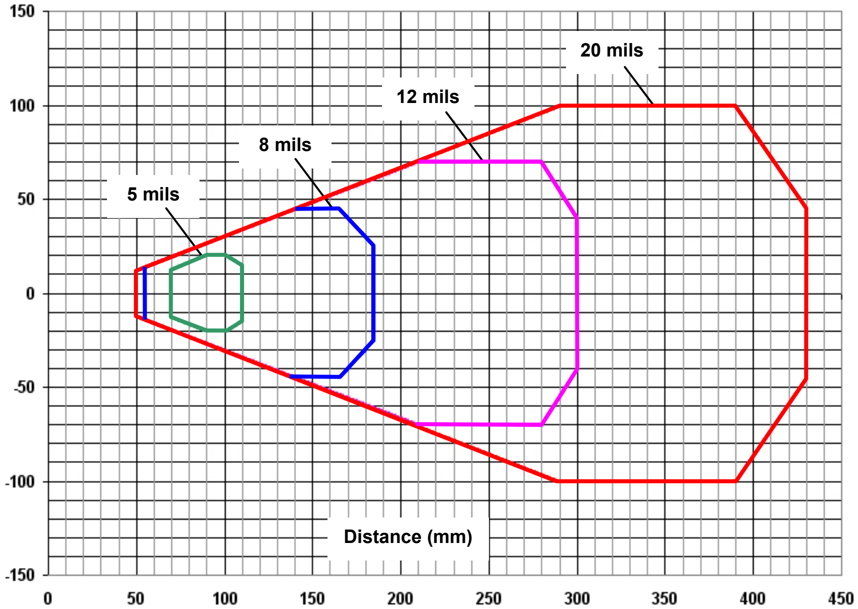
Reading Features	
Max Scans/sec	320
Max resolution	0.076 mm (3mils)
Readable codes:	EAN/UPC; Code 39, Code 32; Code 128, GS1-128, ISBT 128; Interleaved, Standard and Industrial 2 of 5; Codabar, ABC Codabar; GS1 Databar (Omnidirectional, Limited, Expanded); Code 93; Code 11; MSI; Plessey

Physical Features	**Scanner**		**Scan Engine**	
	RS232	**USB**	**RS232**	**USB**
Width	57 mm (2.24 inches)		50 mm (1.96 inches)	
Length	50 mm (1.96 inches)		43 mm (1.69 inches)	
Height	31 mm (1.22 inches)		21 mm (0.82 inches)	
Weight - max.	120 g. (4.2 oz.)	105 g. (3.7 oz.)	30 g. (1 oz.)	

Environmental Features		
Operating Temperature	0° to +50 °C (+32° to +122 °F)	
Storage Temperature	-20° to +70 °C (-4° to +158 °F)	
Operating Pressure	106-80kPa / 0-2000 m above sea level	
Storage Pressure	107-70kPa / 0-3000 m above sea level	
Humidity max.	90% non condensing	
Protection Class EN 60529	IP64	-

7.1 READING DIAGRAMS

The following diagram was obtained according to the conditions listed below. Code reading with skew angles of less than 10° may cause decreased performance due to direct light reflection.



Reading Diagram TC1200-XX00

(0,0) corresponds to the scanner output window.

Conditions:

Static Code Reading
Exposure Mode = Continuous
Code = Code 39
Quality = Grade A
Lighting = No Ambient Light (0 Lux)
Pitch = 0°
Skew = 10°
Tilt = 0°

A DEFAULT PARAMETERS TABLE

Parameter	Default	Your Setting	Page
GLOBAL INTERFACE FEATURES			
Host Commands — Obey/Ignore	Obey		
RS232 ONLY			
Baud Rate	9600		
Data Bits	8 Data Bits		
Stop Bits	1 Stop Bit		
Parity	None		
RS232/USB-COM			
Intercharacter Delay	No Delay		
Disable Character	'D'		
Enable Character	'E'		
ACK NAK Options	Disable		
ACK Character	'ACK'		
NAK Character	'NAK'		
ACK NAK Timeout Value	600 ms		
ACK NAK Retry Count	3 Retries		
ACK NAK Error Handling	Ignore Errors Detected		
USB-KBD			
Keyboard Country Mode	US		
Keyboard Intercode Delay	No Delay		
Send Control Characters	CTRL+KEY		
USB Keyboard Speed	1 ms		
READING PARAMETERS			
Illumination Mode	Triggered		
Operating Modes	On Line		
Phase Off Event	Trigger Stop		
Automatic Threshold			
Timeout			
Serial Start	STX		
Serial Stop	ETX		
LED Indication	On Decode		
Label Programming Mode	Enabled		
Exposure Mode	Continuous		
Reading Conditions	Auto		
DATA FORMAT			
Data Transmission	On Decode		
Code Verifier Mode	Disabled		
Match String			
Wrong Code String			
Case Conversion	Disabled		
Global Prefix (Header)	CR		
Global Suffix (Terminator)			
No Read String	CAN		
Transmit AIM IDs	Disabled		
Transmit Custom Label IDs	Disabled		
Custom Label Identifiers	See table on page 141		

Parameter	Default	Your Setting	Page
DIGITAL OUTPUTS			
OUPUT 1			
Activation Event	Disabled		
Deactivation Event	Disabled		
Deactivation Timeout	500 ms		
Active Level	Active Closed		
OUPUT 2			
Activation Event	Disabled		
Deactivation Event	Disabled		
Deactivation Timeout	500 ms		
Active Level	Active Closed		
POWER SAVE			
Sleep Mode Timeout	Disabled		
CODE SELECTION			
Positive/Negative Background	Positive		
UPC-A			
UPC-A	Enable		
Check Character Tx	Enable		
Expand to EAN-13	Disable		
Number System Tx	Enable		
Minimum Reads	One Read		
Coupon Control	Enable only UPC-A		
UPC-E			
UPC-E	Enable		
Check Character Tx	Enable		
Expand to UPC-A	Disable		
Expand to EAN-13	Disable		
Number System Tx	Enable		
Minimum Reads	Two Reads		
EAN-13			
EAN-13	Enable		
Check Character Tx	Enable		
ISBN Conversion	Disable		
ISSN Conversion	Disable		
Flag 1 Character	Enable		
Minimum Reads	One Read		
Coupon Control	Enable only UPC-A		
EAN-8			
EAN-8	Enable		
Check Character Tx	Enable		
Expand to EAN-13	Disable		
Minimum Reads	One Read		
Add-Ons			
P2 Add-On	Disable		
P5 Add-On	Disable		
P2 Minimum Reads			
P5 Minimum Reads			
Optional Add-On Timer	70 ms		
EAN/UPC Global Settings			
GTIN Format	Disable		
Decoding Level	Level 2		
Character Correlation	Disable		
In-Store Minimum Reads	Two Reads		

Parameter	Default	Your Setting	Page
Code 39			
Code 39	Enable		
Code 39 Full ASCII	Disable		
Code Length Control	Variable		
Set Length	2 - 50		
Code 32 (Italian Pharma)	Disable		
Code 32 Check Tx			
Code 32 Start/Stop Tx			
Code 39 Check Options			
Check Calculation	Disable		
Code 39 Check Tx	Enable		
Code 39 Start/Stop Tx	Disable		
Code 39 Decoding Options			
Minimum Reads	Two Reads		
Decoding Level	Level 3		
Character Correlation	Disable		
Interdigit Ratio	4		
Quiet Zones	Auto		
Stitching	Enable		
Code 128 (GS1-128)			
Code 128	Enable		
GS1-128 Enable	Enable GS1-128 (Transmit Labels in GS1-128 Data Format)		
Code Length Control	Variable		
Set Length	1 - 80		
Expand to Code 39	Disable		
Check Options			
Check Tx	Disable		
Function Character Tx	Disable		
Sub-Code Change Tx	Disable		
Decoding Options			
Minimum Reads	One Read		
Decoding Level	Level 3		
Character Correlation	Disable		
Quiet Zones	Auto		
Stitching	Enable		
ISBT 128			
ISBT 128 Concatenation	Disable		
Force Concatenation			
Concatenation Mode			
Dynamic Concat. Timeout			
Chain 0 - Chain 15			
Interleaved 2 of 5 (I 2 of 5)			
I 2 of 5	Disable		
Standard 2 of 5			
Standard 2 of 5	Disable		
Industrial 2 of 5			
Industrial 2 of 5	Disable		
Codabar			
Codabar	Disable		
Code 11			
Code 11	Disable		
GS1 Databar Omnidirectional			
GS1 Databar Omnidirectional	Disable		

Parameter	Default	Your Setting	Page
GS1 Databar Expanded			
GS1 Databar Expanded	Disable		
GS1 Databar Limited			
GS1 Databar Limited	Disable		
Code 93			
Code 93	Disable		
MSI			
MSI	Disable		
Plessey			
Plessey	Disable		

B KEYPAD

0

1

2

3

4

5

6

7

8

9

A

B

C

D

E

F

CANCEL

C ASCII/HEX/DECIMAL CHART

Char	Hex	Dec	Char	Hex	Dec	Char	Hex	Dec
NUL	**00**	**0**	*	**2A**	**42**	U	**55**	**85**
SOH	**01**	**1**	+	**2B**	**43**	V	**56**	**86**
STX	**02**	**2**	,	**2C**	**44**	W	**57**	**87**
ETX	**03**	**3**	-	**2D**	**45**	X	**58**	**88**
EOT	**04**	**4**	.	**2E**	**46**	Y	**59**	**89**
ENQ	**05**	**5**	/	**2F**	**47**	Z	**5A**	**90**
ACK	**06**	**6**	0	**30**	**48**	[	**5B**	**91**
BEL	**07**	**7**	1	**31**	**49**	\	**5C**	**92**
BS	**08**	**8**	2	**32**	**50**	]	**5D**	**93**
HT	**09**	**9**	3	**33**	**51**	^	**5E**	**94**
LF	**0A**	**10**	4	**34**	**52**	_	**5F**	**95**
VT	**0B**	**11**	5	**35**	**53**	`	**60**	**96**
FF	**0C**	**12**	6	**36**	**54**	a	**61**	**97**
CR	**0D**	**13**	7	**37**	**55**	b	**62**	**98**
SO	**0E**	**14**	8	**38**	**56**	c	**63**	**99**
SI	**0F**	**15**	9	**39**	**57**	d	**64**	**100**
DLE	**10**	**16**	:	**3A**	**58**	e	**65**	**101**
DC1	**11**	**17**	;	**3B**	**59**	f	**66**	**102**
DC2	**12**	**18**	<	**3C**	**60**	g	**67**	**103**
DC3	**13**	**19**	=	**3D**	**61**	h	**68**	**104**
DC4	**14**	**20**	>	**3E**	**62**	i	**69**	**105**
NAK	**15**	**21**	?	**3F**	**63**	j	**6A**	**106**
SYN	**16**	**22**	@	**40**	**64**	k	**6B**	**107**
ETB	**17**	**23**	A	**41**	**65**	l	**6C**	**108**
CAN	**18**	**24**	B	**42**	**66**	m	**6D**	**109**
EM	**19**	**25**	C	**43**	**67**	n	**6E**	**110**
SUB	**1A**	**26**	D	**44**	**68**	o	**6F**	**111**
ESC	**1B**	**27**	E	**45**	**69**	p	**70**	**112**
FS	**1C**	**28**	F	**46**	**70**	q	**71**	**113**
GS	**1D**	**29**	G	**47**	**71**	r	**72**	**114**
RS	**1E**	**30**	H	**48**	**72**	s	**73**	**115**
US	**1F**	**31**	I	**49**	**73**	t	**74**	**116**
SPACE	**20**	**32**	J	**4A**	**74**	u	**75**	**117**
!	**21**	**33**	K	**4B**	**75**	v	**76**	**118**
"	**22**	**34**	L	**4C**	**76**	w	**77**	**119**
#	**23**	**35**	M	**4D**	**77**	x	**78**	**120**
$	**24**	**36**	N	**4E**	**78**	y	**79**	**121**
%	**25**	**37**	O	**4F**	**79**	z	**7A**	**122**
&	**26**	**38**	P	**50**	**80**	{	**7B**	**123**
'	**27**	**39**	Q	**51**	**81**	|	**7C**	**124**
(	**28**	**40**	R	**52**	**82**	}	**7D**	**125**
)	**29**	**41**	S	**53**	**83**	~	**7E**	**126**
			T	**54**	**84**	DEL	**7F**	**127**

Char	Hex	Dec	Char	Hex	Dec	Char	Hex	Dec
	80	128		AA	170		D5	213
	81	129		AB	171		D6	214
	82	130		AC	172		D7	215
	83	131		AD	173		D8	216
	84	132		AE	174		D9	217
	85	133		AF	175		DA	218
	86	134		B0	176		DB	219
	87	135		B1	177		DC	220
	88	136		B2	178		DD	221
	89	137		B3	179		DE	222
	8A	138		B4	180		DF	223
	8B	139		B5	181		E0	224
	8C	140		B6	182		E1	225
	8D	141		B7	183		E2	226
	8E	142		B8	184		E3	227
	8F	143		B9	185		E4	228
	90	144		BA	186		E5	229
	91	145		BB	187		E6	230
	92	146		BC	188		E7	231
	93	147		BD	189		E8	232
	94	148		BE	190		E9	233
	95	149		BF	191		EA	234
	96	150		C0	192		EB	235
	97	151		C1	193		EC	236
	98	152		C2	194		ED	237
	99	153		C3	195		EE	238
	9A	154		C4	196		EF	239
	9B	155		C5	197		F0	240
	9C	156		C6	198		F1	241
	9D	157		C7	199		F2	242
	9E	158		C8	200		F3	243
	9F	159		C9	201		F4	244
	A0	160		CA	202		F5	245
	A1	161		CB	203		F6	246
	A2	162		CC	204		F7	247
	A3	163		CD	205		F8	248
	A4	164		CE	206		F9	249
	A5	165		CF	207		FA	250
	A6	166		D0	208		FB	251
	A7	167		D1	209		FC	252
	A8	168		D2	210		FD	253
	A9	169		D3	211		FE	254
				D4	212		FF	255

D RESERVED CHARACTERS

Reserved Characters	Hex Value	Notes
[SOH]	0x01	
[BEL]	0x07	
#	0x23	
$	0x24	
0	0x30	
3	0x33	
B	0X42	
D	0X44	
E	0X45	
F	0X46	
R	0X52	
S	0X53	
h	0x68	
i	0x69	
s	0x73	
t	0x74	
[FF]	0xFF	
Reserved Strings		
C<up to 36 chars>[CR]	0x43 <xxx> 0x0D	C can be used without [CR] or inside a string (not the first character)
01[CR]	0x30 0x31 0x0D	
34[CR]	0x33 0x34 0x0D	

DATALOGIC	DECLARATION OF CONFORMITY	EC-126 Rev.: 2 Pag.: 1 di 1

CE

Datalogic Automation S.r.l.
Via Lavino 265
40050 Monte San Pietro
Bologna - Italy
www.automation.datalogic.com

declares that the

TC1200; Compact CCD Reader

and all its models

are in conformity with the requirements of the European Council Directives listed below:

2004 / 108 / EC EMC Directive

This Declaration is based upon compliance of the products to the following standards:

EN 55022 (CLASS A ITE), DECEMBER 2010:	*INFORMATION TECHNOLOGY EQUIPMENT RADIO DISTURBANCE CHARACTERISTICS LIMITS AND METHODS OF MEASUREMENTS*
EN 61000-6-2, SEPTEMBER 2005:	*ELECTROMAGNETIC COMPATIBILITY (EMC) PART 6-2: GENERIC STANDARDS - IMMUNITY FOR INDUSTRIAL ENVIRONMENTS*

Monte San Pietro, January 20th, 2012

Paolo Morselli
Quality Manager

Morselli Paolo

UNI EN ISO 9001 UNI EN ISO 14001